OLYMPUS

MAINTENANCE MANUAL

CLV-160

INTRODUCTION

Repairs of this product require high-grade special knowledge and technique. We recommend to contact the Olympus agent in your country when the product goes out of order. For remodeling or repairs to be done by the agent or person not authorized by us, we will not warrant the product and not be liable for any result.

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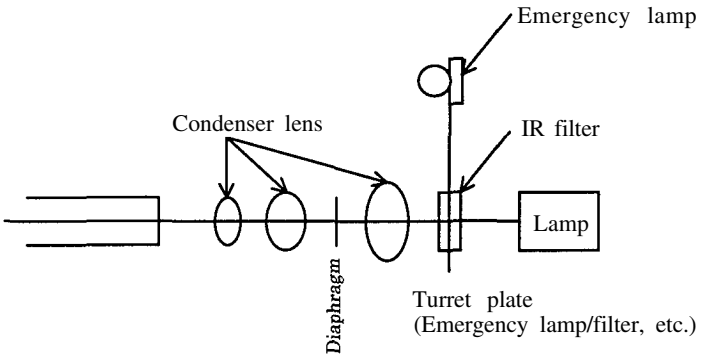
1. SPECIFICATIONS

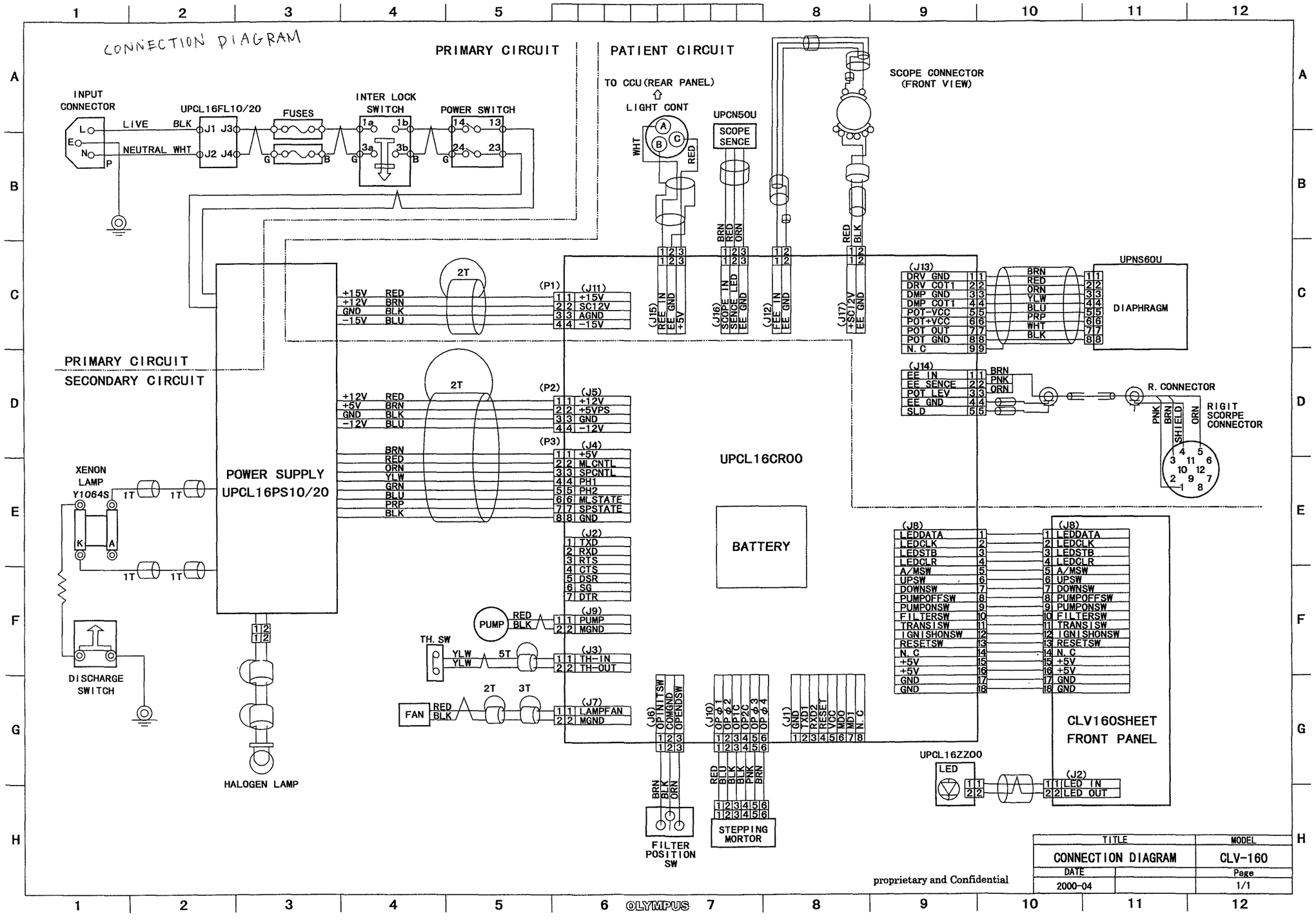
Item			Specification
1 Applicable scopes	1. Video scope		1. EVISl00 series 2. EVIS130 series 3. EVIS140 series 4. VE series 5. EVIS EXERA 145 series 6. EVIS EXERA 160 series 7. BF 160 series
	2. Fiberscope		1. OES10 series 2. OES20 series 3. OES30 series 4. OES40 series 5. BF/CHF scope
2 Illumination function	1 Optics	Illumination light path	 (1) The user sets a special filter if necessary. One special filter frame is provided. (2) The emergency lamp is automatically placed into the optical axis when the diagnostic lamp does not light.
2 Illumination function	2 Illumination light	Diagnostic lamp	• Xenon short arc lamp with an elliptic mirror • Model: Y1064 Ⓢ • Life: Approx. 500 hours when operated continuously
		Emergency lamp	• Halogen 150W (peanut type) • Model: PHILIPS 7023 12V/100W or the equivalent • Life: 100 hours or more in average
	3 Brightness adjustment	Method	(1) Manual control only for the fiberscope. (Automatic control when using OES video system and OVC simultaneously.) (2) Automatic control for the video scone.
		Manual light adjustment	(1) Mechanical diaphragm (set on the panel) (2) 17 steps
		Automatic light adjustment	(1) Mechanical diaphragm with the constant illuminance control (the illuminance on the image) (2) 17 steps
	4 Cooling	Method	Forced air cooling with a fan

Item			Specification
3 Air/water supply function	1 Air supply	Air supply pump	Diaphragm system
		Air supply pressure	(1) Adjustable in 3 steps (strong/medium/weak and stop) (2) Maximum pressure less than 53.9kPa
		Control	Setting of the air supply switch
	2 Water supply	Method	Supply from the scope end by combining the scope with the supply water tank.
4 Connection	Scope		One touch connection
	Light control cable:MH-966		Connector on the rear panel (Light control cable for CV)
	Light control cable:MAJ-586		Connector on the rear panel (Light control cable for OTV)
5 Error indication	Emergency lamp		When the emergency lamp breaks (including connection failure), LED flickers to warn to replace the lamp. When the emergency lamp is lit, LED is lit.
6 Panel	Storage of set values		The setting is stored before the power switch is turned off and when the power switch is turned off. • Setting of manual/auto light adjustment • Setting of air supply pressure • Light intensity control level
7 Safety	1 Dimming	On removal of the scope	When the scope is removed, the emergent light from the scope output connector is dimmed with the diaphragm blade to the minimum diaphragm position.
	2 Disinfection	Panel	Disinfect with ethanol for disinfection (70% ethyl or isopropyl alcohol) or sterilized water.
	3 Warning tone	Temperature switch	When the temperature in the system rises over the rated maximum value, the temperature switch automatically turns off and the current is shut off to ensure safety. The function of the temperature switch is detected and warned by an audible tone.

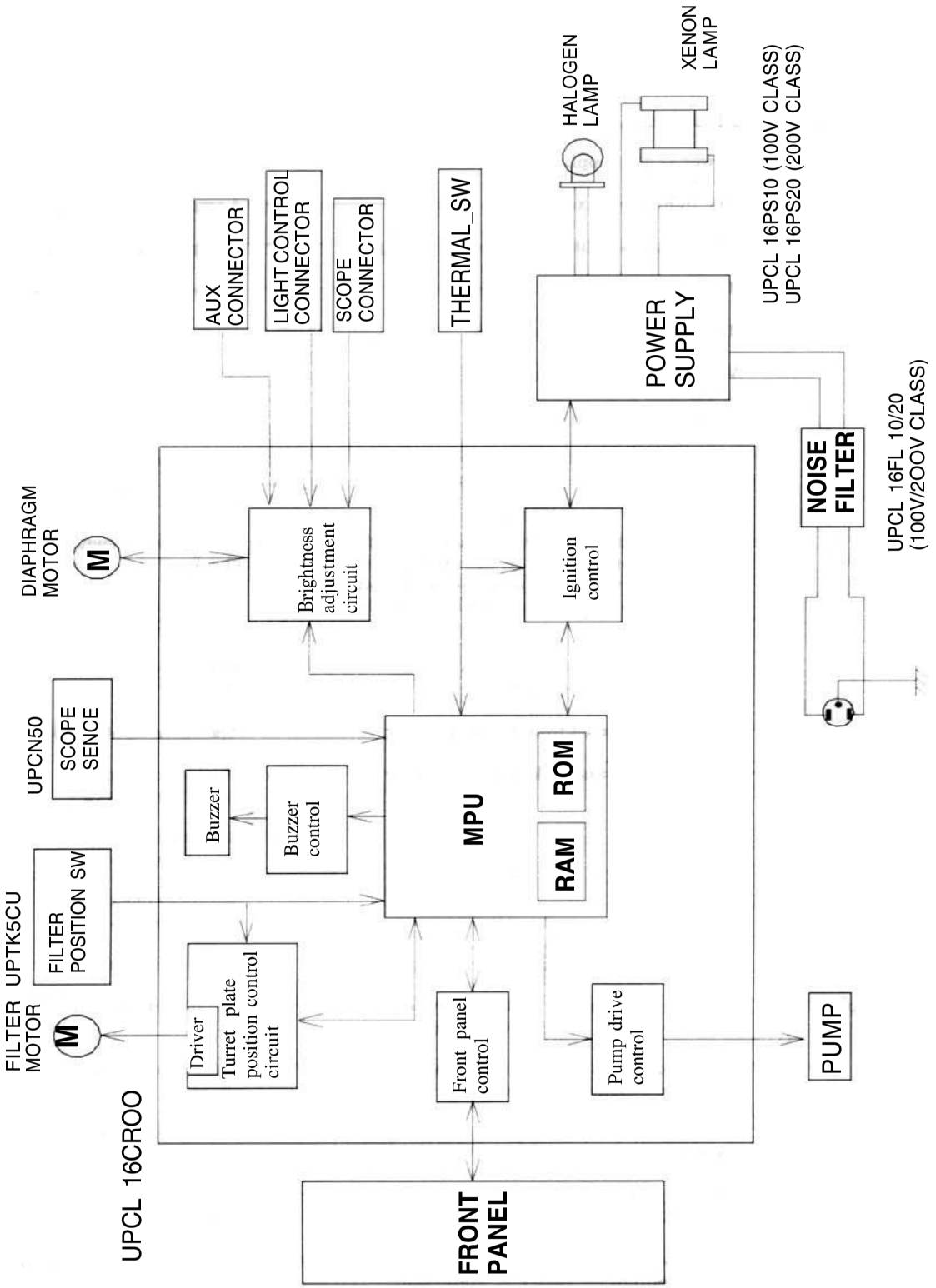
Item				Specification	
7 Safety	4 Electrical shock	Protection system		Class I units (3P power supply)	
	5 Laws and regulations applied			Non-Olympus regulations applied	
		Common to every country		IEC513 (hazard analysis) IEC60601-1 (medical electronics safety) IEC60601-l-1 (medical electric system safety) IEC60601-1-2 (EMC) IEC60601-2-18 (endoscope electric safety)	ISO9000-3 (software) ISO8600-1 (endoscope) ISO7000 (drawings and symbols) IEC417 (drawings and symbols)
		Country/Area		Applied laws and regulations/classification	Non-Olympus regulations applied
			1 EU/EFTA	MDD Class: IIa CE marking: CE_{0197}	IEC60601-1 (medical electronics safety) IEC60601-l-1 (medical electric system safety) IEC60601-1-2 (EMC) IEC60601-2-18 (endoscope electric safety) EN980 (drawings and symbols)
			2 USA	FDC laws (Federal Foods/Medicine/Cosmetics Laws)	UL544,CUL
			3. Japan	The Drugs, Cosmetics and Medical Instruments Act General name: Light source Approval No. : 07BZ0043	JIST1001 (medical electric equipment safety) JIST1002 (medical electric equipment safety test) JIST1005 (medical electric equipment manual)
			4 Other countries	Nothing	Russia: GOST-R
8 Others	1 Using conditions	Classification of medical instruments		100 V type: BF type instruments 200 V type: BF type fitting part Note) When the fitting part has no indication of protection against an electric shock, it is the BF type fitting part.	
		Protection against an electrical shock		Class I	
	2 Replaceable parts	User service		Xenon lamp, Special filter, Fuse	
		Maker service		Emergency lamp, Lamp socket	
	3 Others	Weight		Approx. 15 kg	
		Dimensions (Maximum)		385 (w) x 490 (D) x 145 (H) [mm]	

Item			Specification
8 Others	3 Others	Panel	Selectable for each destination. 100 V type: English 200 V type: English/symbol
		Power cord	Cord set with a 3-core hospital grade plug (100V) 3-pin inlet, 3-core cord plug-less cord set (200V)
		Fuse capacity	100V type: BA, Littel 313008 (or the equivalent) 200V type: 5A, Littel 218005 (or the equivalent) In-Olympus symbol: MAJ-892(100V CLASS), MAJ-893(2OOV CLASS)
		Backup lithium battery on power failure	Lithium battery life: 6.2 years

2. CONNECTION DIAGRAM



3. BLOCK DIAGRAM

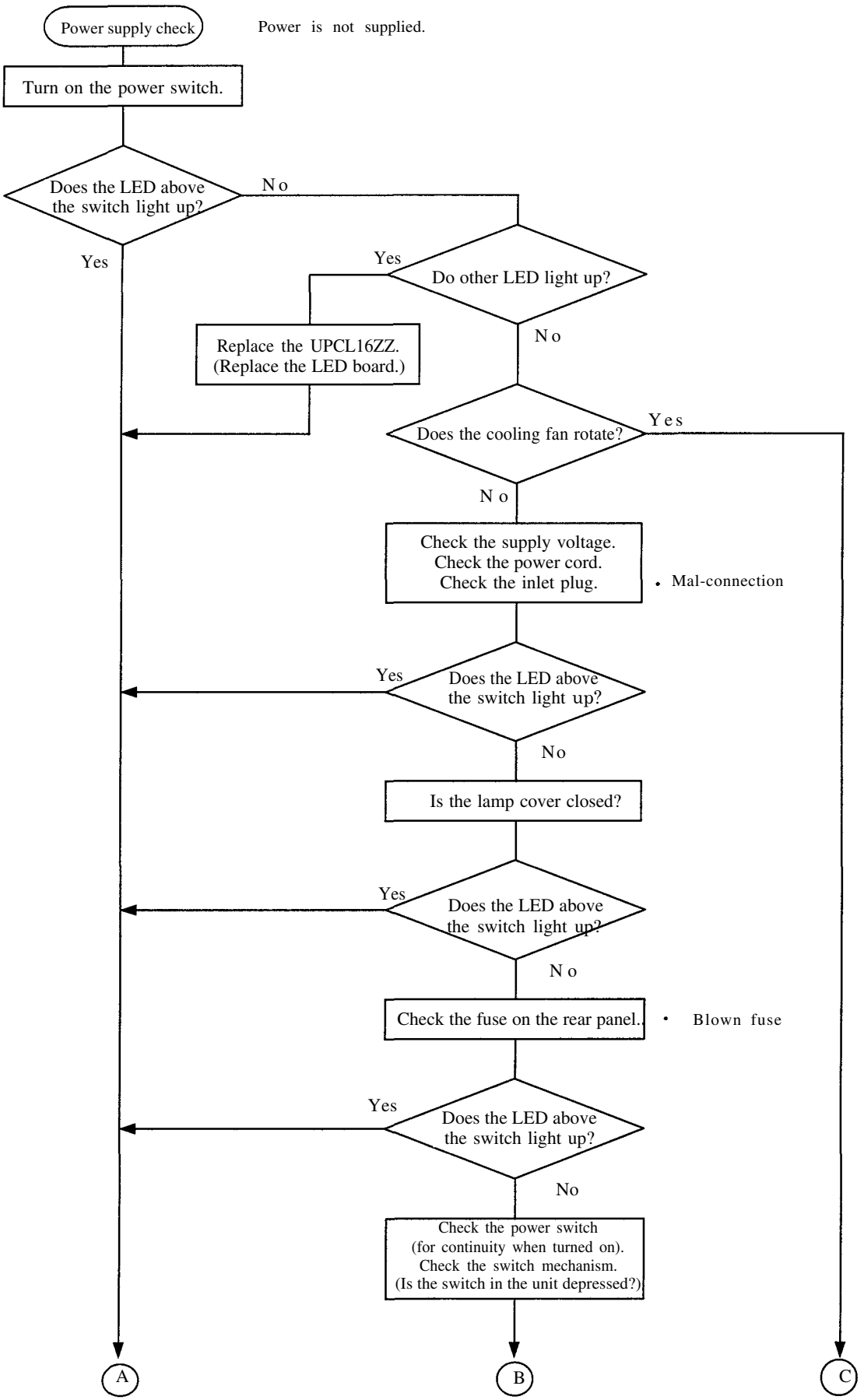


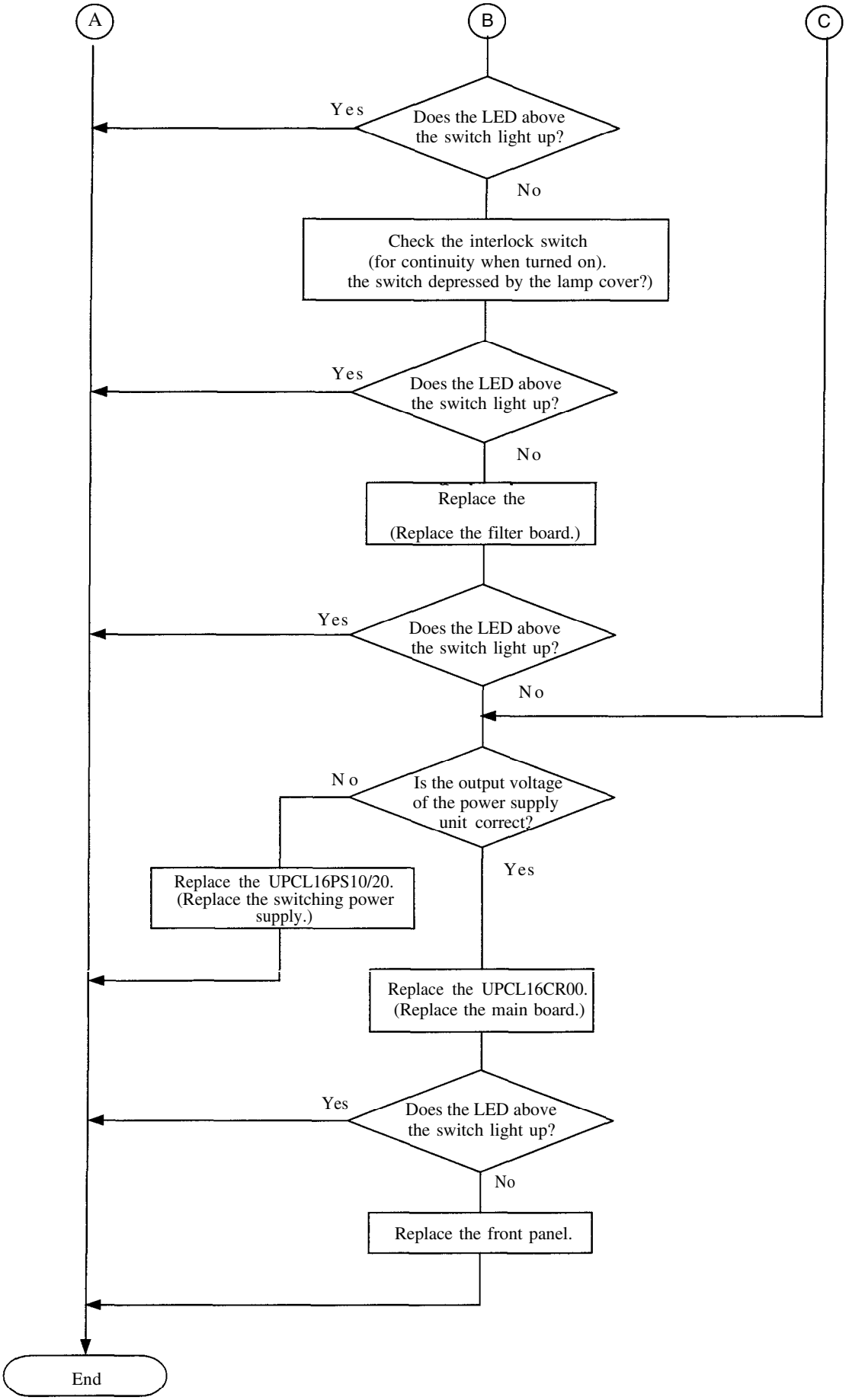
4. TROUBLESHOOTING

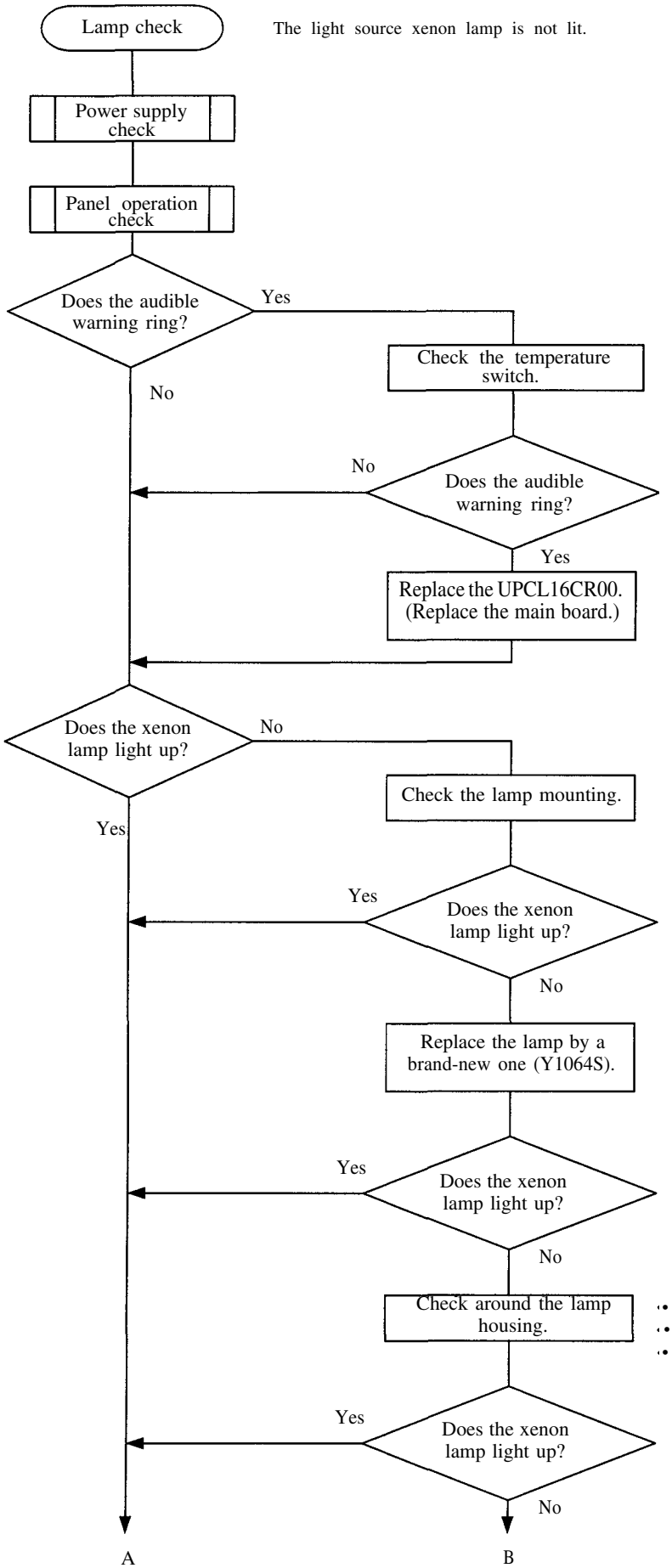
1. CONTENTS

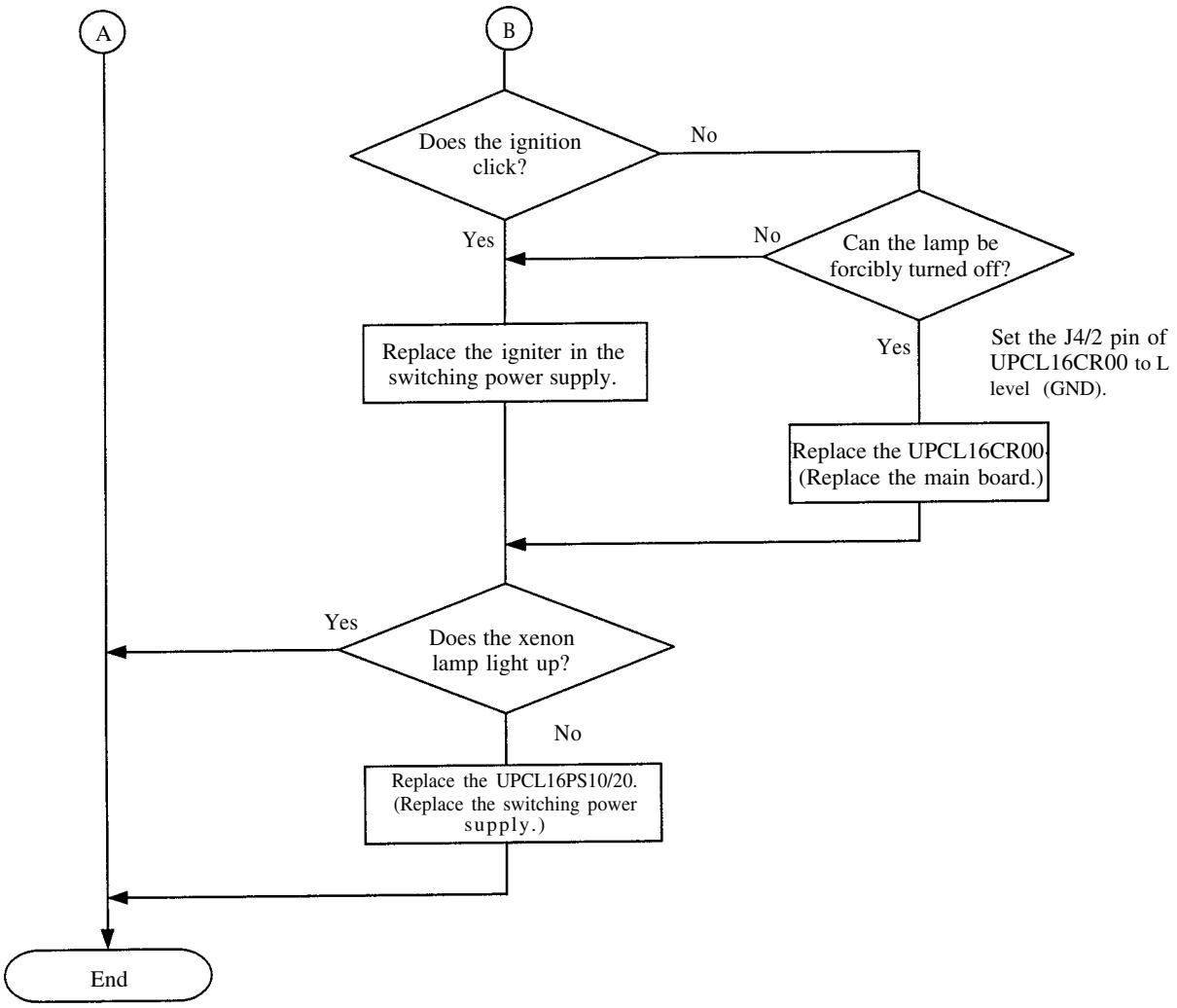
Classification	Symptom	Check item	Page
Light source unit/Lamp	Power is not supplied.	Power supply check	2 to 3
	The light source xenon lamp is not ht.	Lamp check	4 to 5
	The lamp goes out after once ignition up.	Lamp going-out check	6 to 7
	The scope cannot be connected.	Scope connection check	8
	The cooling fan does not work.	Cooling fan operation check	9
	When the scope is disconnected, the brightness is not reduced to the minimum or changed.	Shielding check on removal of the scope	10
	The pump does not work or the supply air flowrate does not change even if the pump ON switch is depressed.	Pump check	11 to 12
	The temperature switch does not turn off even if the temperature in the unit rises over the specified value, or the temperature switch malfunctions at the temperature below the specified value.	Temperature switch function check	13
	The turret plate does not rotate even if the filter switch is depressed.	Filter switching operation check	14 to 15
Observation	No light is emitted from the scope.	Emergent light check	16
	The visual field is dark or too bright.	Manual brightness adjustment check	17
		Automatic brightness adjustment check 1	18
		Automatic brightness adjustment check 2	19 to 20
		Lamp brightness check	21
Setting/Display	LED does not light or LED indication does not change even if the switch is depressed.	Panel operation check	22
	The emergency lamp is not automatically lit when the xenon lamp goes out.	Emergency lamp operation check	23 to 24
	The values set before the power is turned off are not stored when the power is turned off.	Backup function check	25
	The lamp life meter does not return to zero even if the lamp life meter reset switch.	Lamp life meter reset function check	26
	Brightness does not change even if the transillumination switch is depressed.	Transillumination function check	27

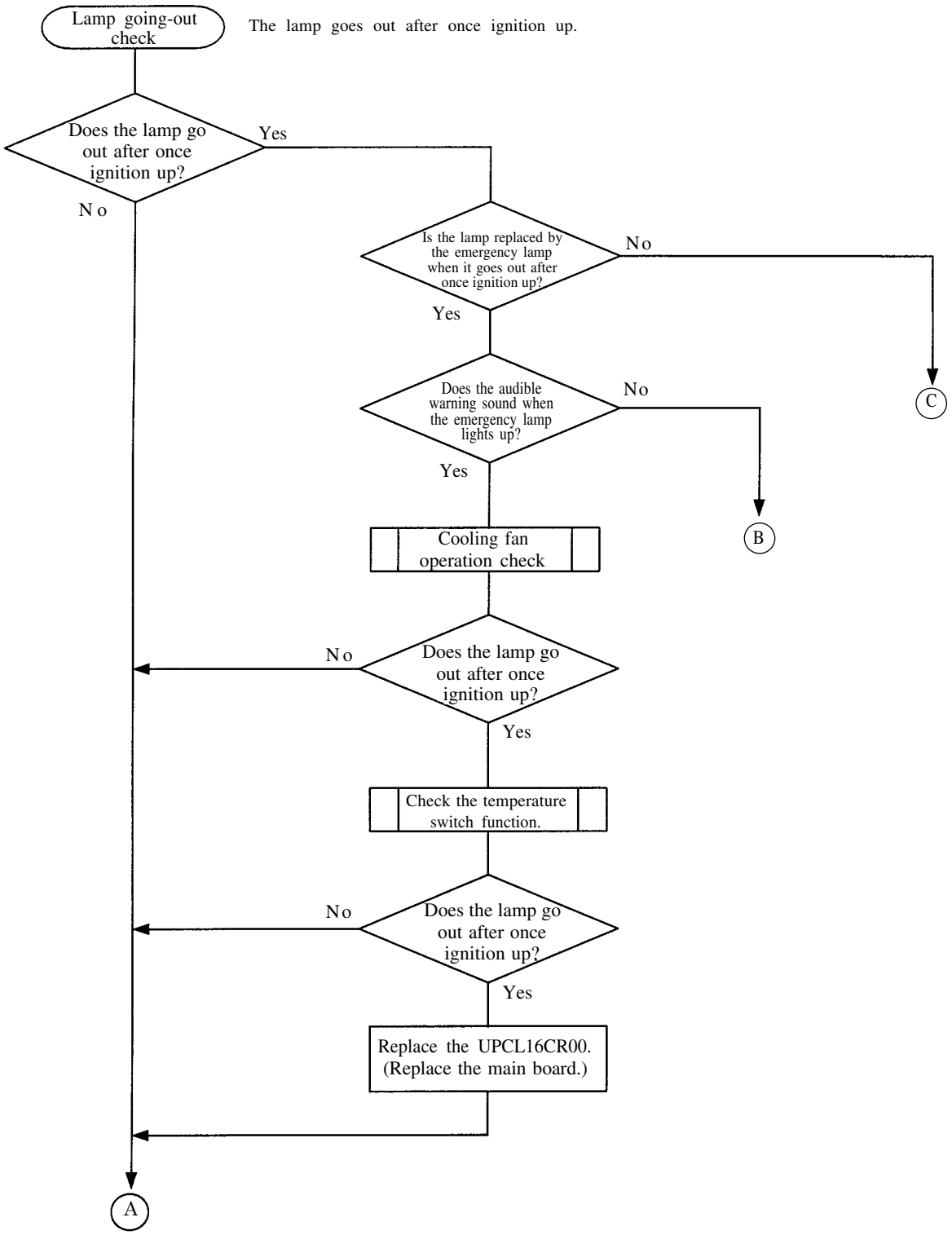
2. TROUBLESHOOTING

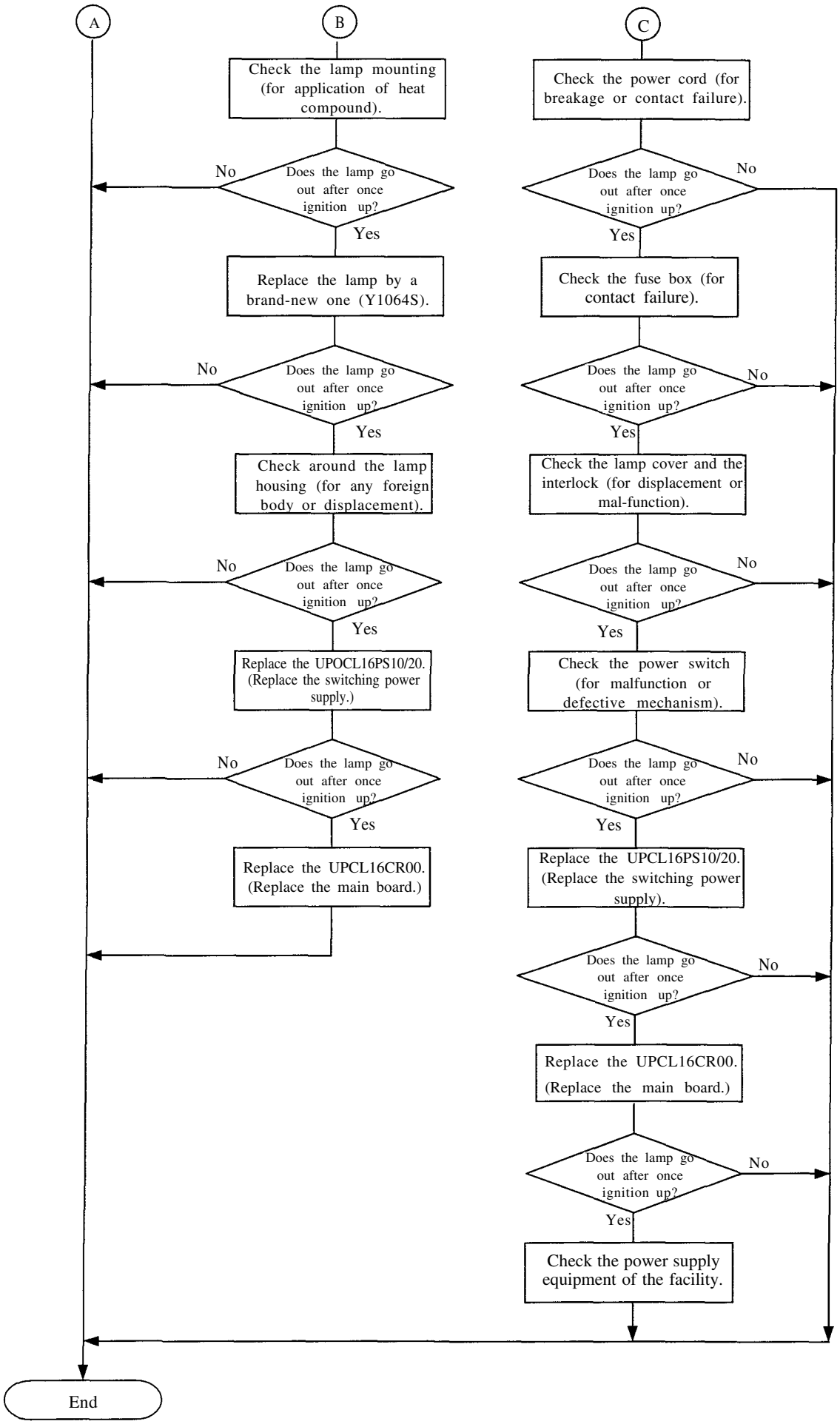


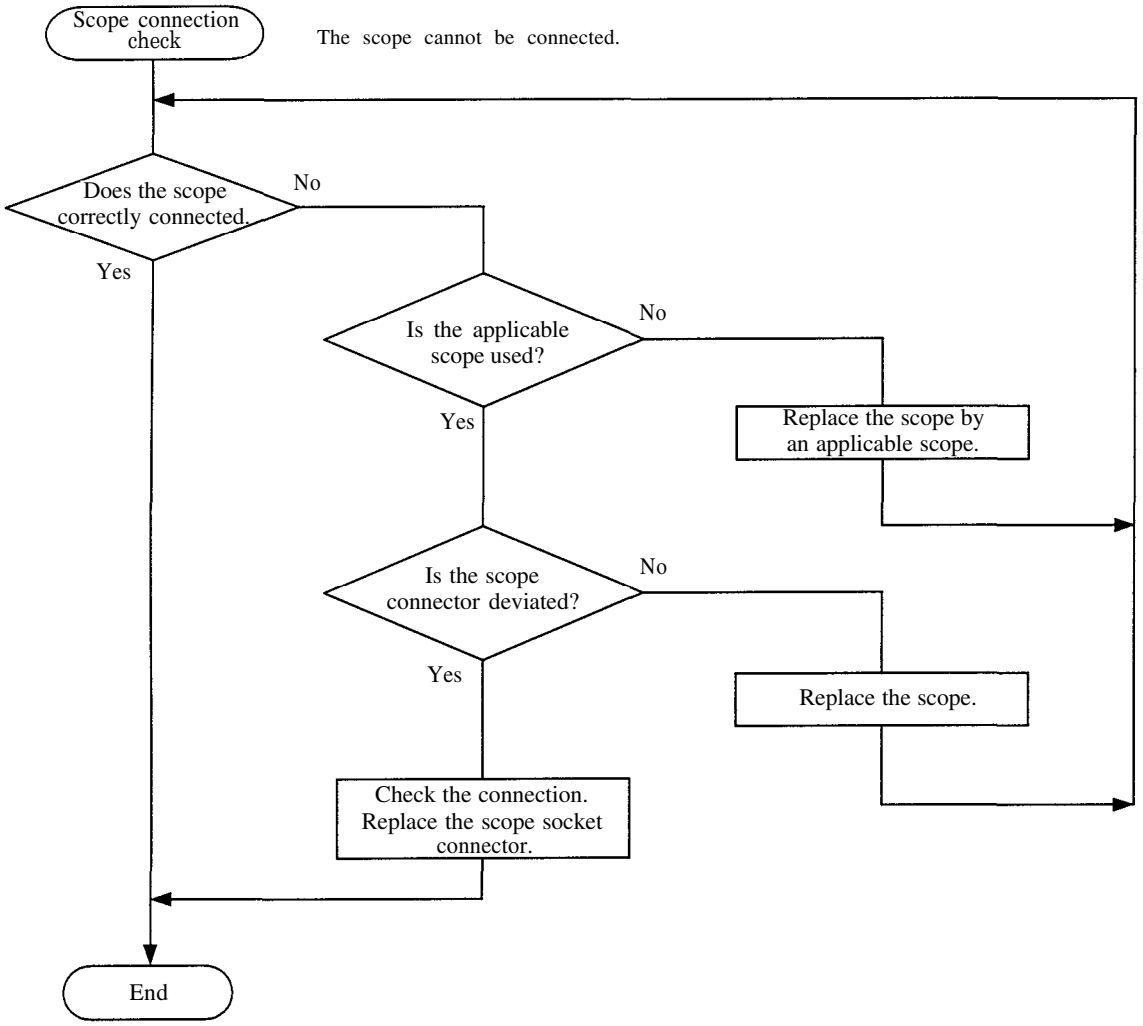

A
B
C
Yes
Does the LED above the switch light up?
No
Check the interlock switch (for continuity when turned on). the switch depressed by the lamp cover?)
Yes
Does the LED above the switch light up?
No
Replace the
(Replace the filter board.)
Yes
Does the LED above the switch light up?
No
No
Is the output voltage of the power supply unit correct?
Yes
Replace the UPCL16PS10/20. (Replace the switching power supply.)
Replace the UPCL16CR00. (Replace the main board.)
Yes
Does the LED above the switch light up?
No
Replace the front panel.
End

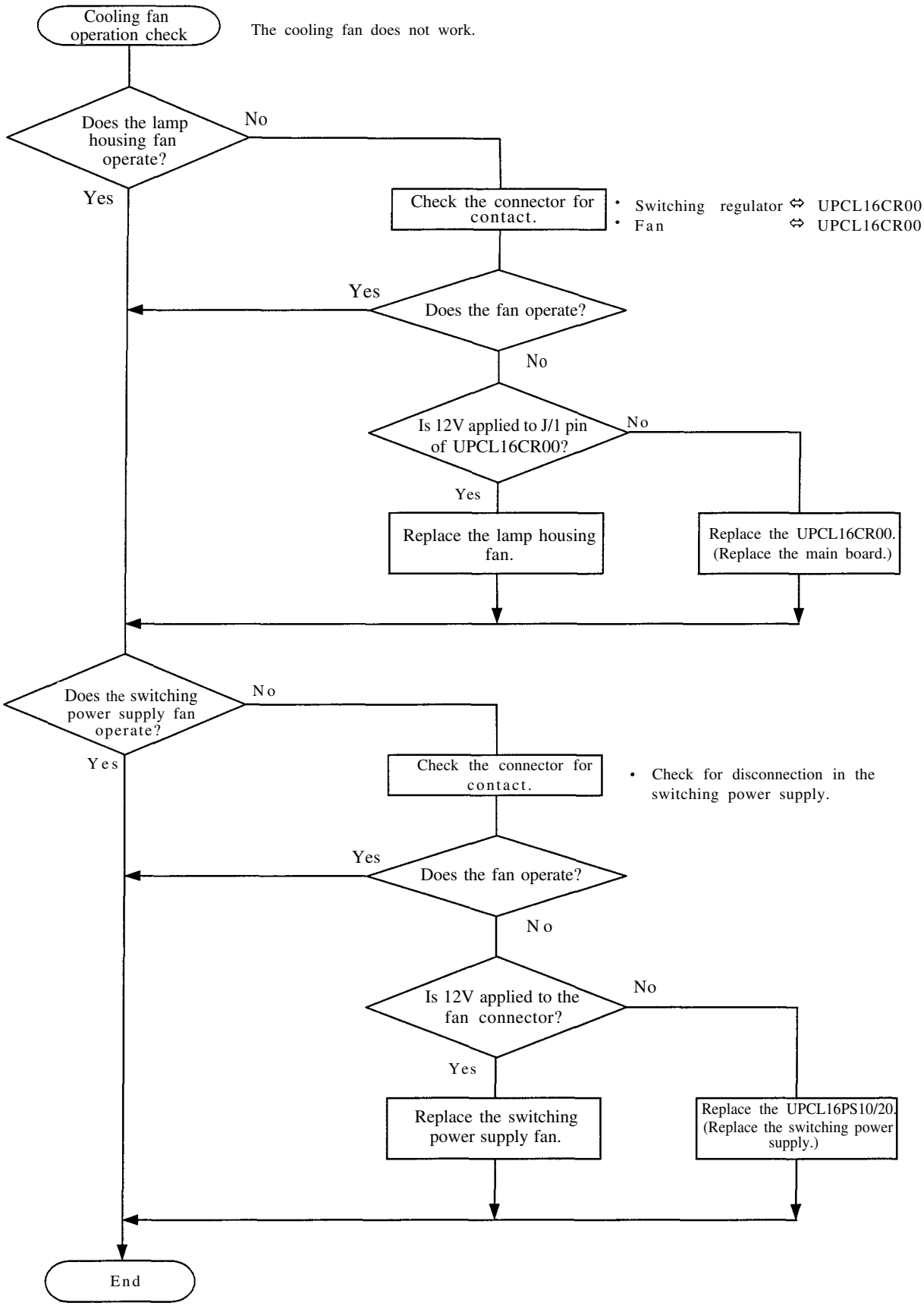

Lamp check
The light source xenon lamp is not lit.
Power supply check
Panel operation check
Does the audible warning ring?
Yes
No
Check the temperature switch.
• ON if normal.
No
Does the audible warning ring?
Yes
Replace the UPCL16CR00. (Replace the main board.)
Does the xenon lamp light up?
No
Yes
Check the lamp mounting.
• The lamp is correctly mounted. The heat compound is correctly painted.
Yes
Does the xenon lamp light up?
No
Replace the lamp by a brand-new one (Y1064S).
Yes
Does the xenon lamp light up?
No
Check around the lamp housing.
• Unnecessary things (metallic pieces, etc.)
• High voltage pulse leaks.
• Connection with the electrode F and electrode R. The round terminal is close to the lamp housing.
Yes
Does the xenon lamp light up?
No
A
B

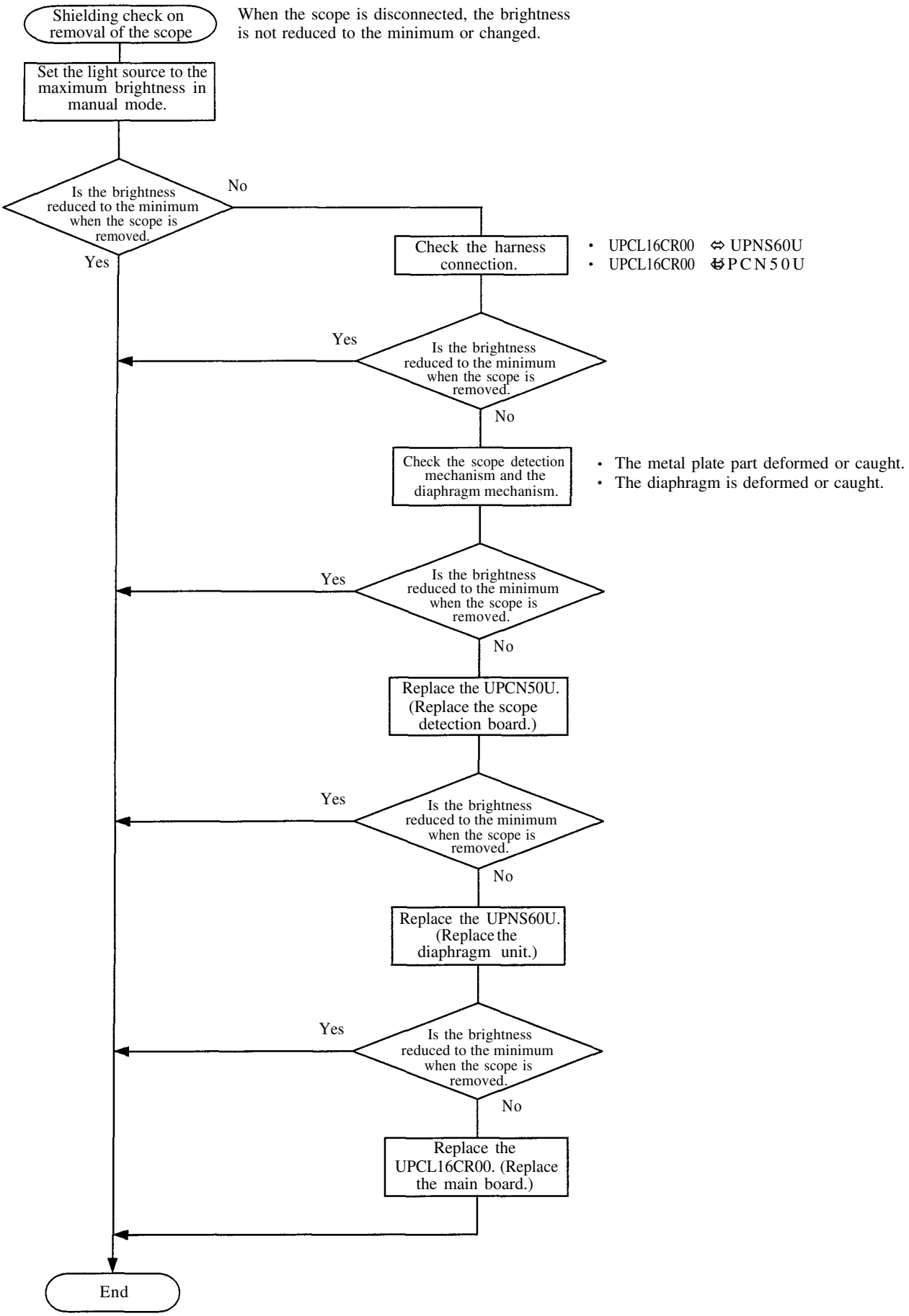

A
B
Does the ignition click?
No
Yes
No
Can the lamp be forcibly turned off?
Yes
Set the J4/2 pin of UPCL16CR00 to L level (GND).
Replace the igniter in the switching power supply.
Replace the UPCL16CR00. (Replace the main board.)
Yes
Does the xenon lamp light up?
No
Replace the UPCL16PS10/20. (Replace the switching power supply.)
End

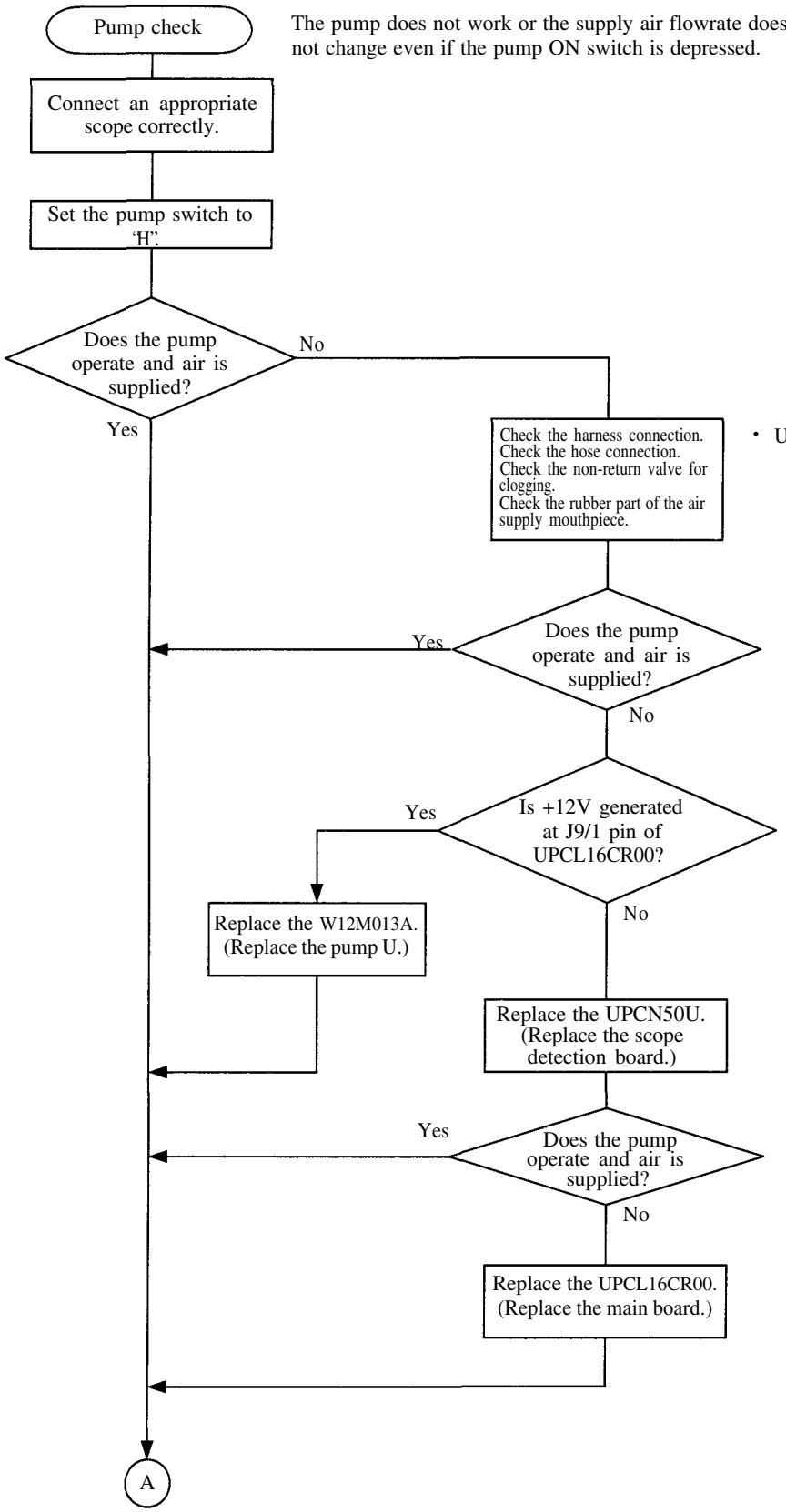

Lamp going-out check
The lamp goes out after once ignition up.
Does the lamp go out after once ignition up?
Yes
No
Is the lamp replaced by the emergency lamp when it goes out after once ignition up?
No
Yes
Does the audible warning sound when the emergency lamp lights up?
No
Yes
C
B
Cooling fan operation check
Does the lamp go out after once ignition up?
No
Yes
Check the temperature switch function.
Does the lamp go out after once ignition up?
No
Yes
Replace the UPCL16CR00. (Replace the main board.)
A

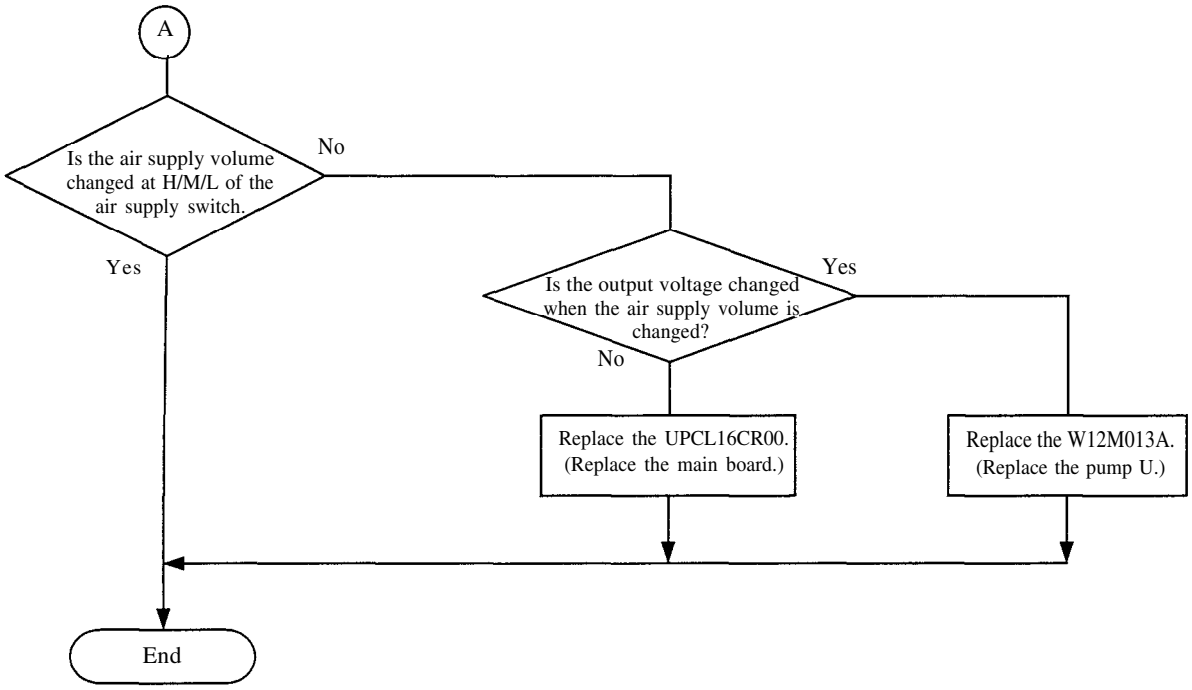

A
B
C
Check the lamp mounting (for application of heat compound).
Does the lamp go out after once ignition up?
No
Yes
Replace the lamp by a brand-new one (Y1064S).
Does the lamp go out after once ignition up?
No
Yes
Check around the lamp housing (for any foreign body or displacement).
Does the lamp go out after once ignition up?
No
Yes
Replace the UPOCL16PS10/20. (Replace the switching power supply.)
Does the lamp go out after once ignition up?
No
Yes
Replace the UPCL16CR00. (Replace the main board.)
Check the power cord (for breakage or contact failure).
Does the lamp go out after once ignition up?
No
Yes
Check the fuse box (for contact failure).
Does the lamp go out after once ignition up?
No
Yes
Check the lamp cover and the interlock (for displacement or mal-function).
Does the lamp go out after once ignition up?
No
Yes
Check the power switch (for malfunction or defective mechanism).
Does the lamp go out after once ignition up?
No
Yes
Replace the UPCL16PS10/20. (Replace the switching power supply).
Does the lamp go out after once ignition up?
No
Yes
Replace the UPCL16CR00. (Replace the main board.)
Does the lamp go out after once ignition up?
No
Yes
Check the power supply equipment of the facility.
End

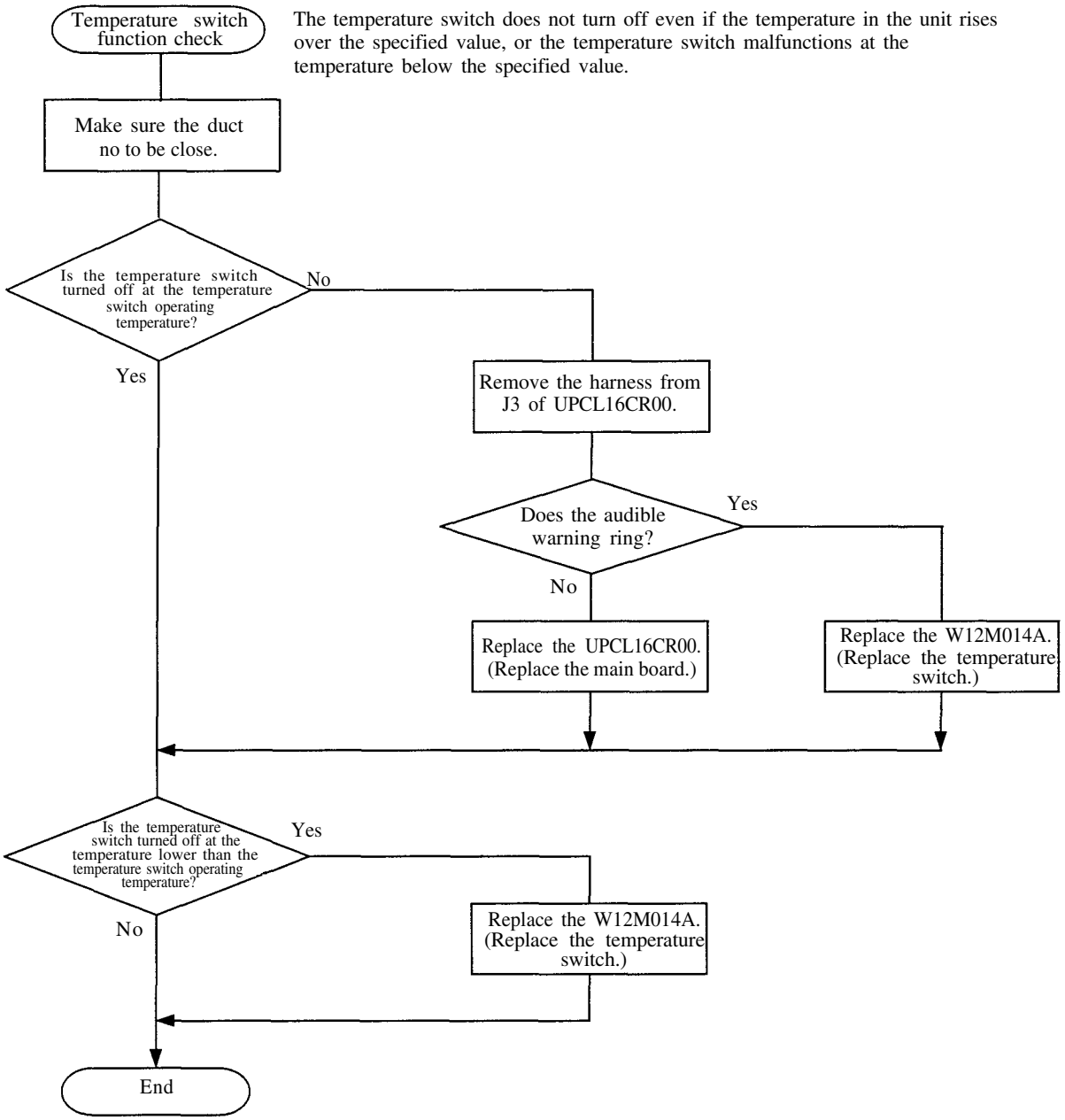

Scope connection check
The scope cannot be connected.
Does the scope correctly connected.
No
Yes
Is the applicable scope used?
No
Yes
Replace the scope by an applicable scope.
Is the scope connector deviated?
No
Yes
Replace the scope.
Check the connection. Replace the scope socket connector.
End

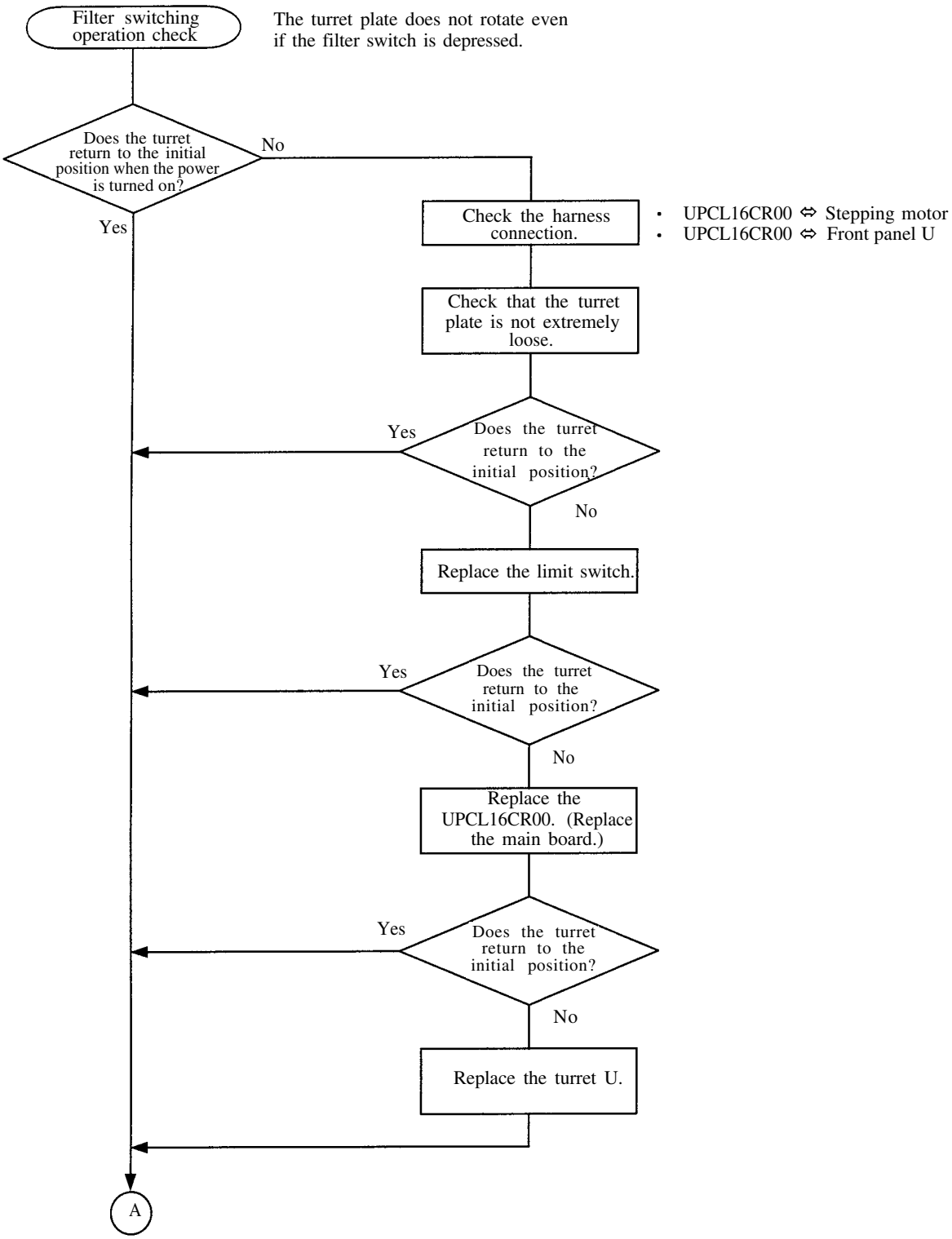

Cooling fan operation check
The cooling fan does not work.
Does the lamp housing fan operate?
No
Yes
Check the connector for contact.
• Switching regulator ⇔ UPCL16CR00
• Fan ⇔ UPCL16CR00
Yes
Does the fan operate?
No
Is 12V applied to J/1 pin of UPCL16CR00?
No
Yes
Replace the lamp housing fan.
Replace the UPCL16CR00. (Replace the main board.)
Does the switching power supply fan operate?
No
Yes
Check the connector for contact.
• Check for disconnection in the switching power supply.
Yes
Does the fan operate?
No
Is 12V applied to the fan connector?
No
Yes
Replace the switching power supply fan.
Replace the UPCL16PS10/20. (Replace the switching power supply.)
End

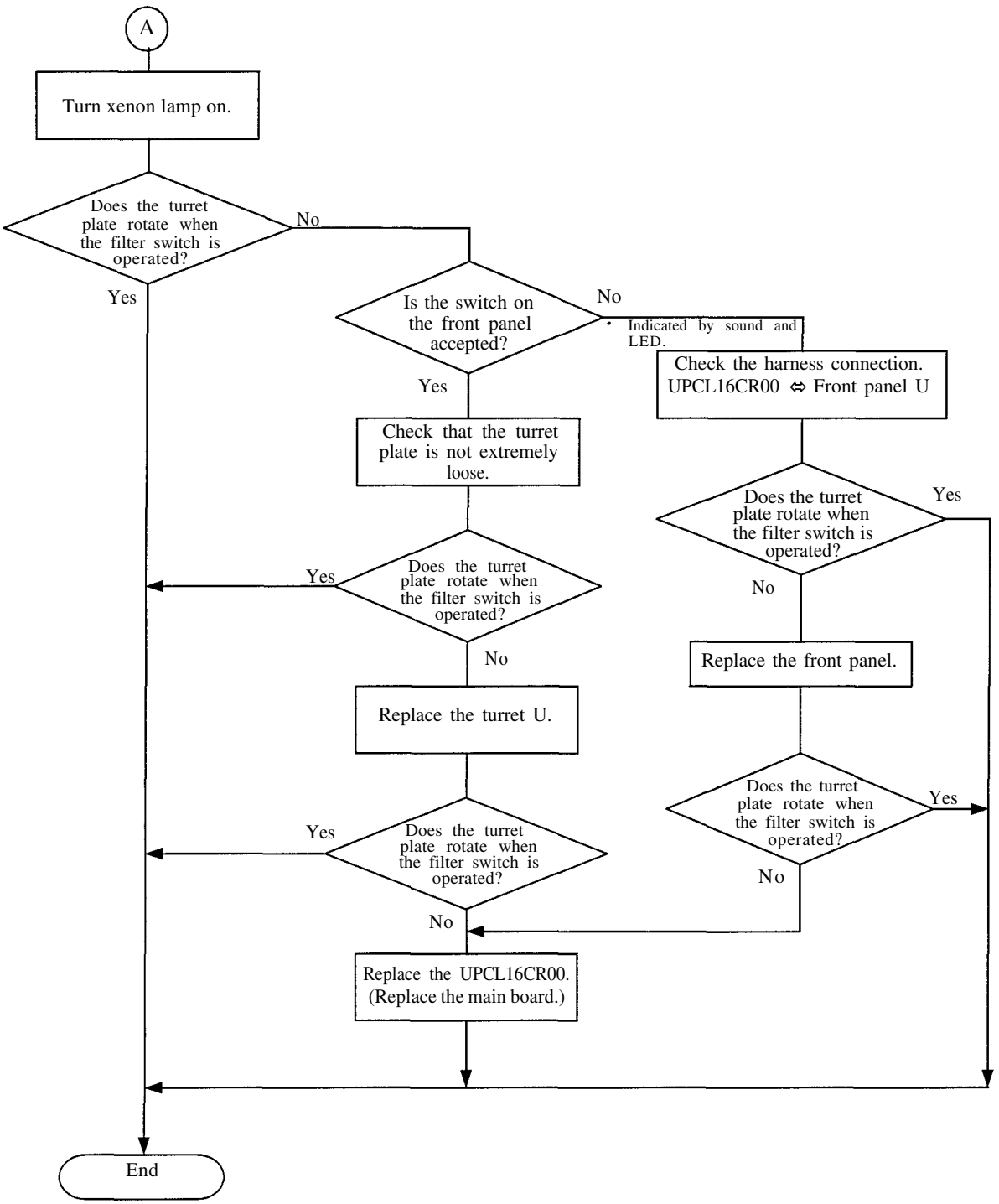

Shielding check on removal of the scope
When the scope is disconnected, the brightness is not reduced to the minimum or changed.
Set the light source to the maximum brightness in manual mode.
Is the brightness reduced to the minimum when the scope is removed.
No
Yes
Check the harness connection.
• UPCL16CR00 ⇔ UPNS60U
• UPCL16CR00 ⇔ UPCN50U
Yes
Is the brightness reduced to the minimum when the scope is removed.
No
Check the scope detection mechanism and the diaphragm mechanism.
• The metal plate part deformed or caught.
• The diaphragm is deformed or caught.
Yes
Is the brightness reduced to the minimum when the scope is removed.
No
Replace the UPCN50U. (Replace the scope detection board.)
Yes
Is the brightness reduced to the minimum when the scope is removed.
No
Replace the UPNS60U. (Replace the diaphragm unit.)
Yes
Is the brightness reduced to the minimum when the scope is removed.
No
Replace the UPCL16CR00. (Replace the main board.)
End

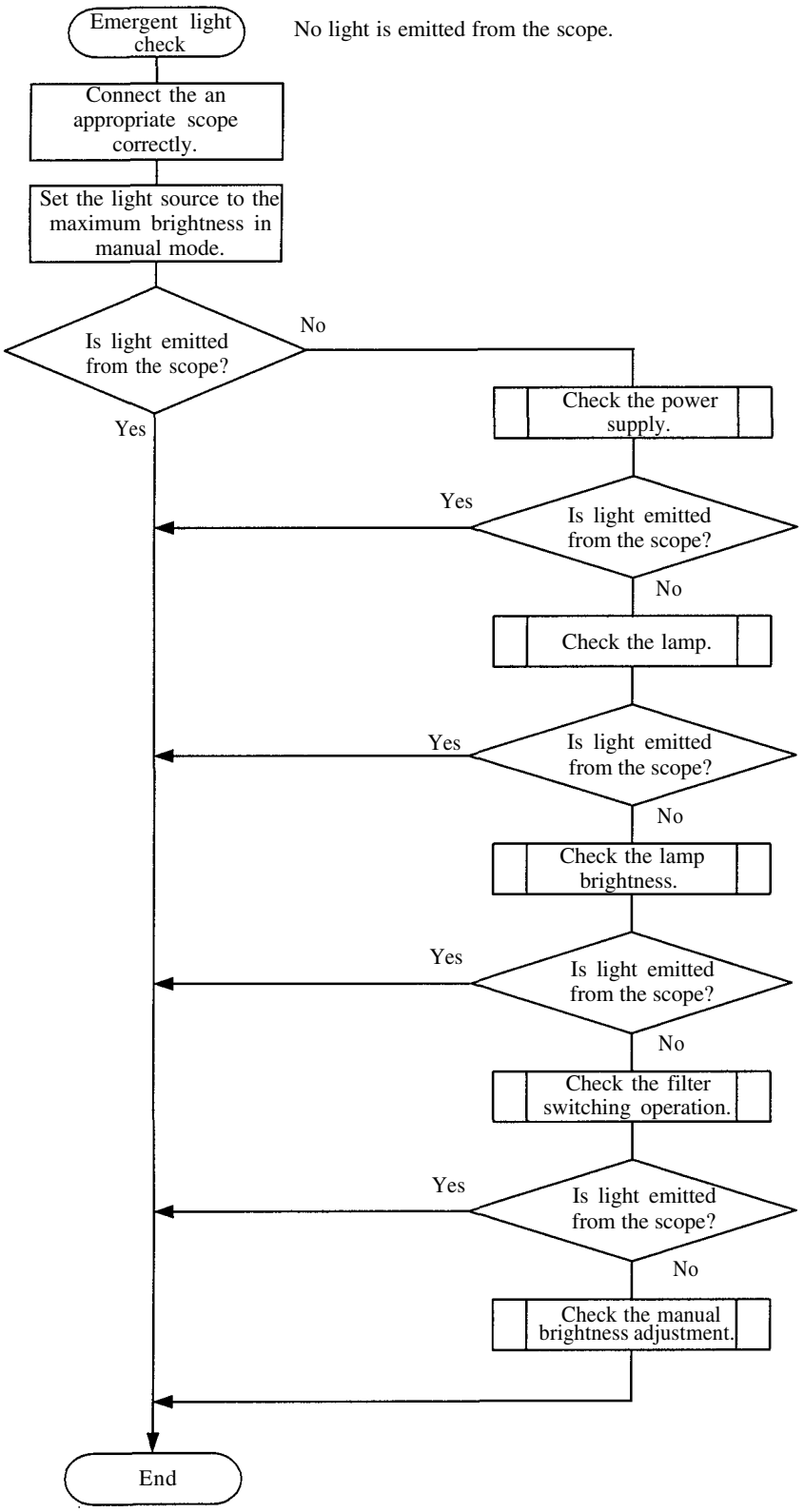

Pump check
The pump does not work or the supply air flowrate does not change even if the pump ON switch is depressed.
Connect an appropriate scope correctly.
Set the pump switch to "H".
Does the pump operate and air is supplied?
No
Yes
Check the harness connection.
Check the hose connection.
Check the non-return valve for clogging.
Check the rubber part of the air supply mouthpiece.
• UPCL16CR00 ⇔ Front panel U
Does the pump operate and air is supplied?
Yes
No
Is +12V generated at J9/1 pin of UPCL16CR00?
Yes
No
Replace the W12M013A. (Replace the pump U.)
Replace the UPCN50U. (Replace the scope detection board.)
Does the pump operate and air is supplied?
Yes
No
Replace the UPCL16CR00. (Replace the main board.)
A

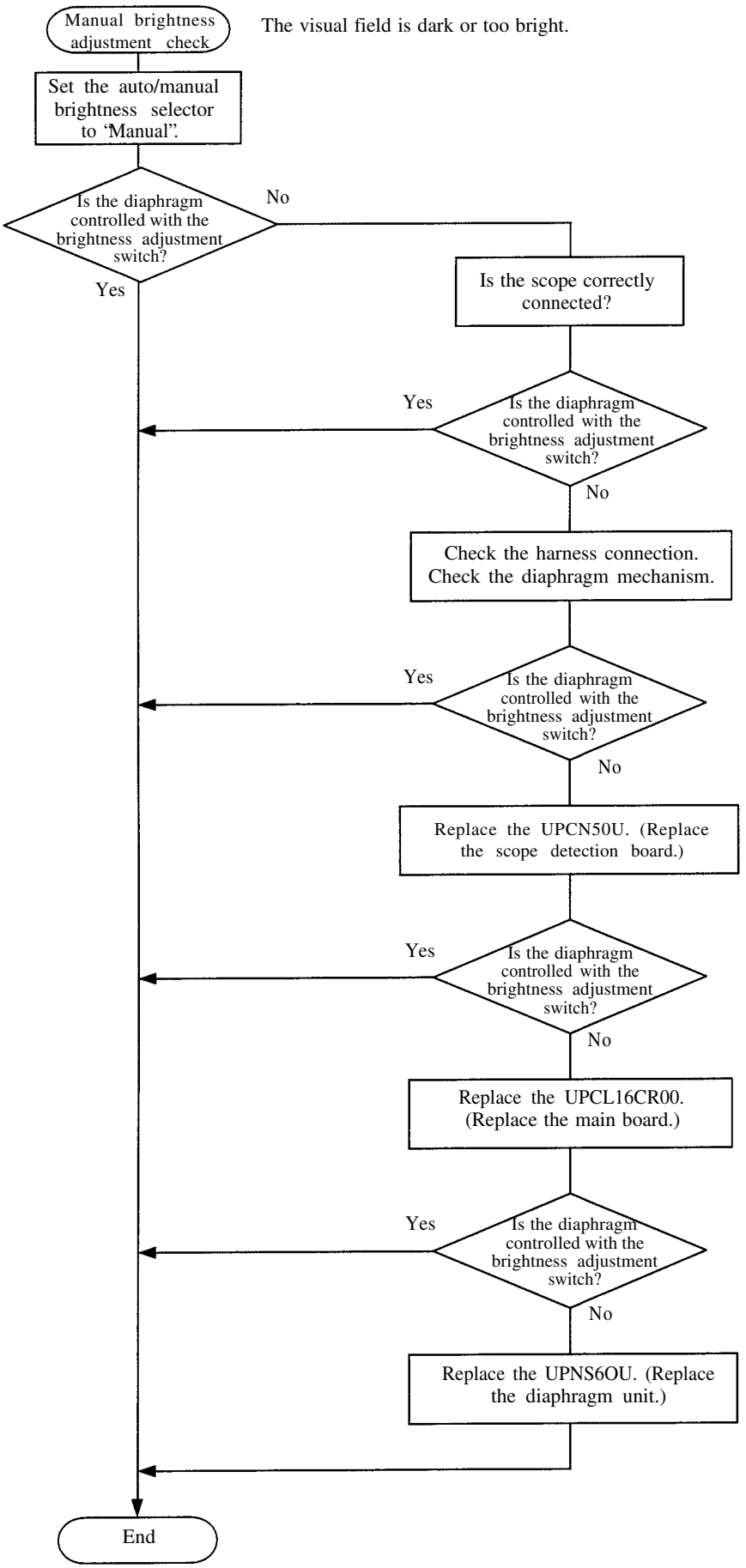

A
Is the air supply volume changed at H/M/L of the air supply switch.
No
Yes
Is the output voltage changed when the air supply volume is changed?
Yes
No
Replace the UPCL16CR00. (Replace the main board.)
Replace the W12M013A. (Replace the pump U.)
End

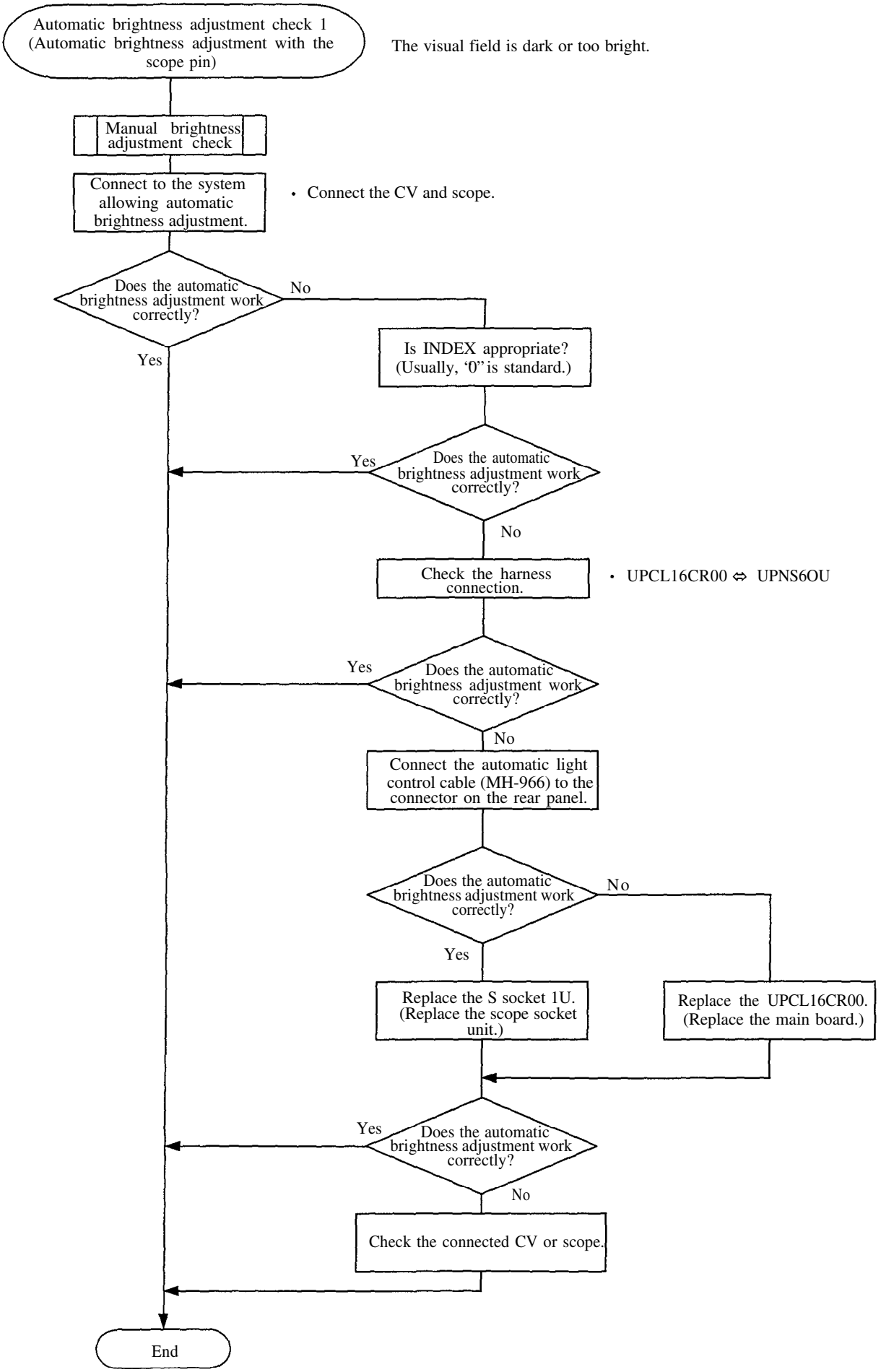

Temperature switch function check
The temperature switch does not turn off even if the temperature in the unit rises over the specified value, or the temperature switch malfunctions at the temperature below the specified value.
Make sure the duct no to be close.
Is the temperature switch turned off at the temperature switch operating temperature?
No
Yes
Remove the harness from J3 of UPCL16CR00.
Does the audible warning ring?
Yes
No
Replace the UPCL16CR00. (Replace the main board.)
Replace the W12M014A. (Replace the temperature switch.)
Is the temperature switch turned off at the temperature lower than the temperature switch operating temperature?
Yes
No
Replace the W12M014A. (Replace the temperature switch.)
End

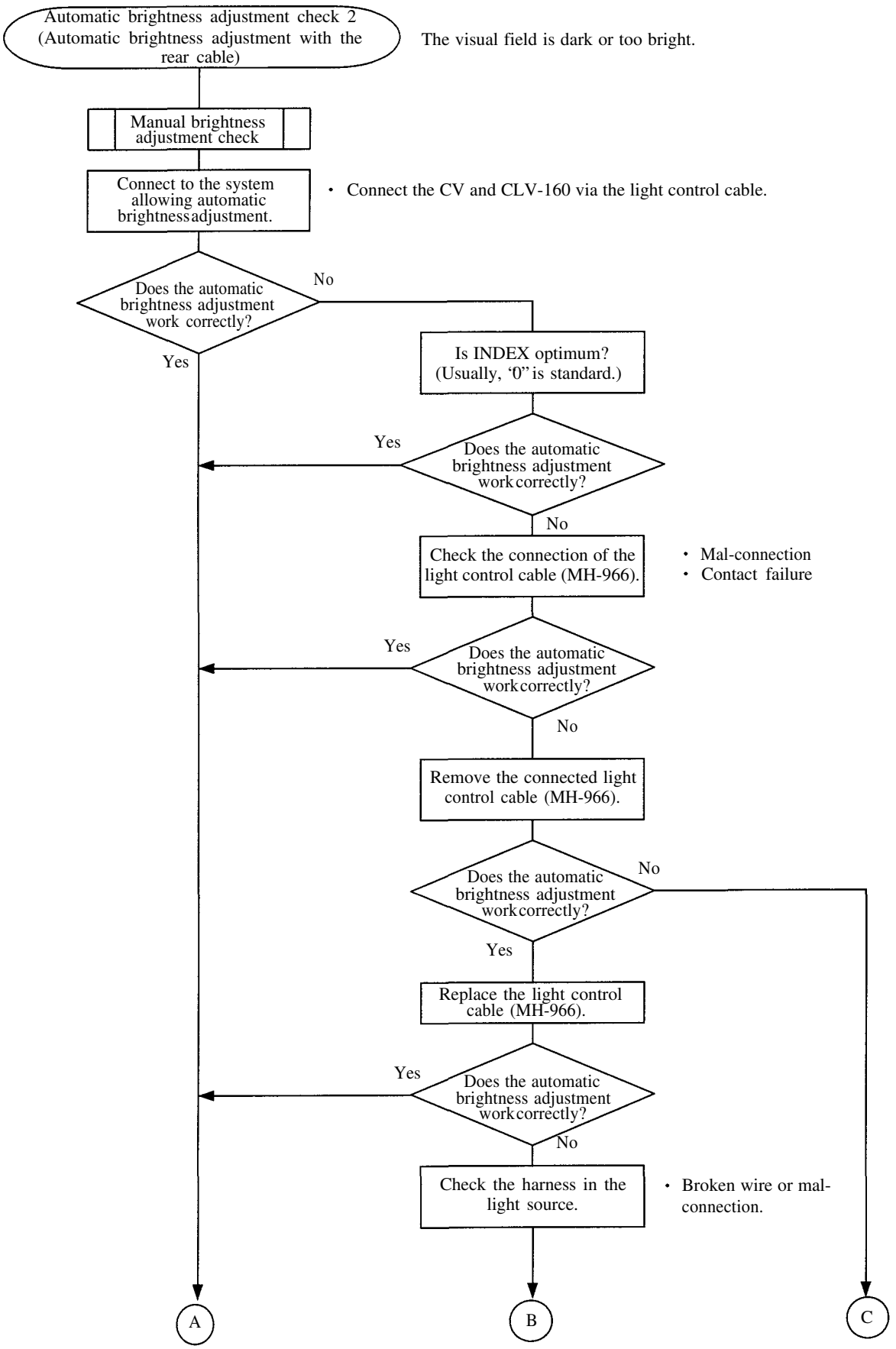

Filter switching operation check
The turret plate does not rotate even if the filter switch is depressed.
Does the turret return to the initial position when the power is turned on?
No
Yes
Check the harness connection.
• UPCL16CR00 ⇔ Stepping motor
• UPCL16CR00 ⇔ Front panel U
Check that the turret plate is not extremely loose.
Yes
Does the turret return to the initial position?
No
Replace the limit switch.
Yes
Does the turret return to the initial position?
No
Replace the UPCL16CR00. (Replace the main board.)
Yes
Does the turret return to the initial position?
No
Replace the turret U.
A

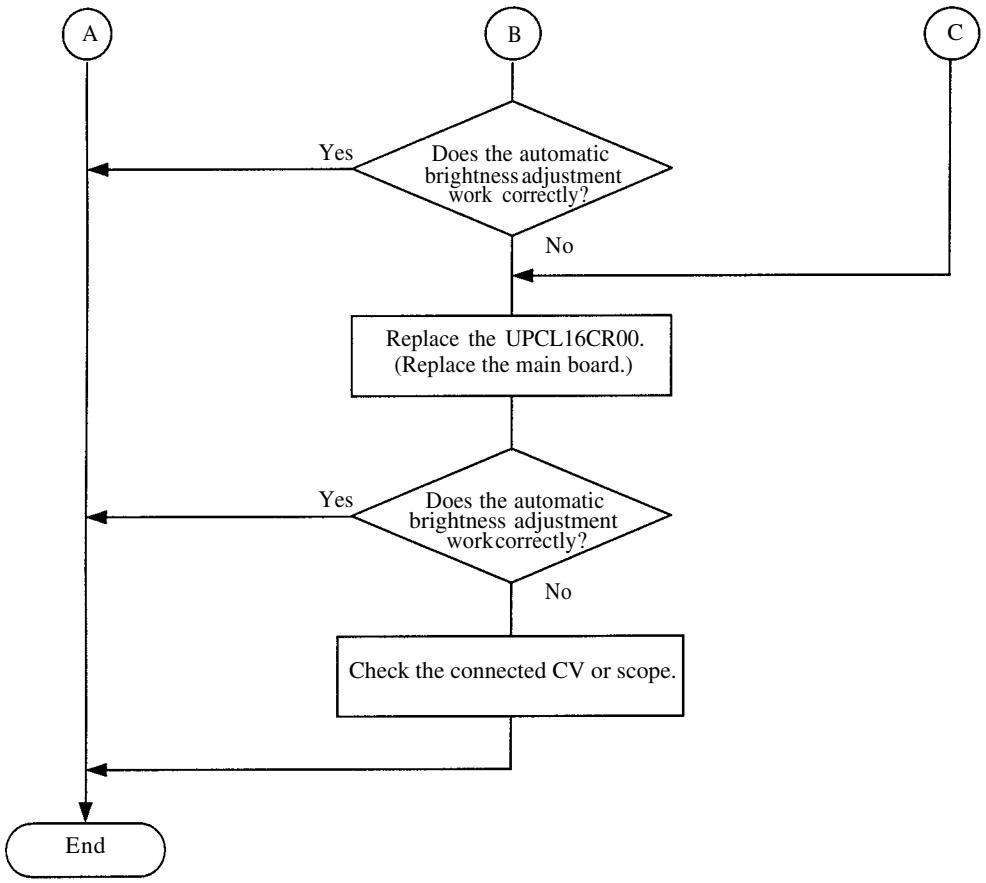

A
Turn xenon lamp on.
Does the turret plate rotate when the filter switch is operated?
No
Yes
Is the switch on the front panel accepted?
No
• Indicated by sound and LED.
Check the harness connection. UPCL16CR00 ⇔ Front panel U
Yes
Check that the turret plate is not extremely loose.
Does the turret plate rotate when the filter switch is operated?
Yes
Yes
No
Replace the front panel.
Does the turret plate rotate when the filter switch is operated?
Yes
No
Replace the turret U.
Does the turret plate rotate when the filter switch is operated?
Yes
No
Replace the UPCL16CR00. (Replace the main board.)
End

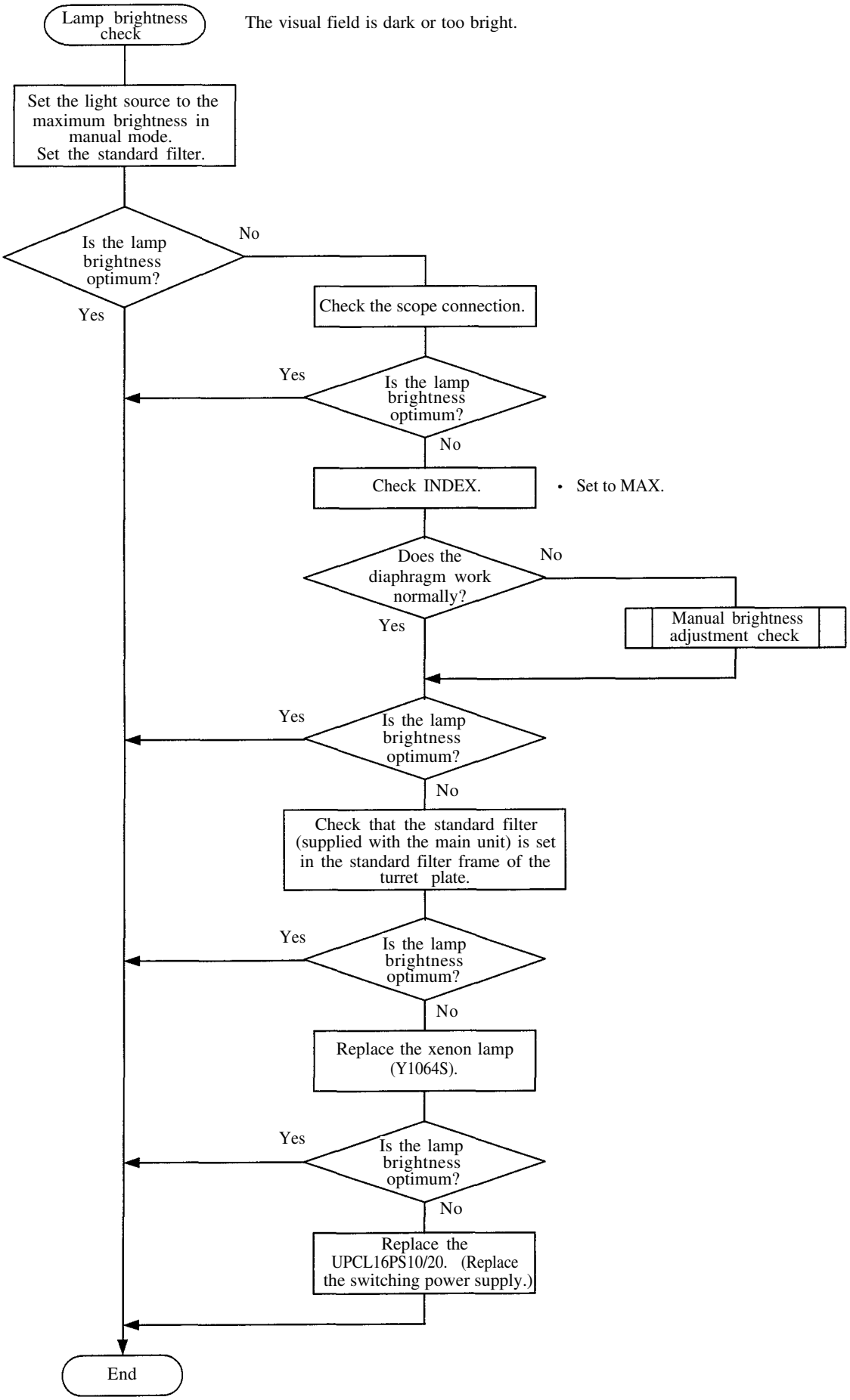

Emergent light check
No light is emitted from the scope.
Connect the an appropriate scope correctly.
Set the light source to the maximum brightness in manual mode.
Is light emitted from the scope?
No
Yes
Check the power supply.
Yes
Is light emitted from the scope?
No
Check the lamp.
Yes
Is light emitted from the scope?
No
Check the lamp brightness.
Yes
Is light emitted from the scope?
No
Check the filter switching operation.
Yes
Is light emitted from the scope?
No
Check the manual brightness adjustment.
End

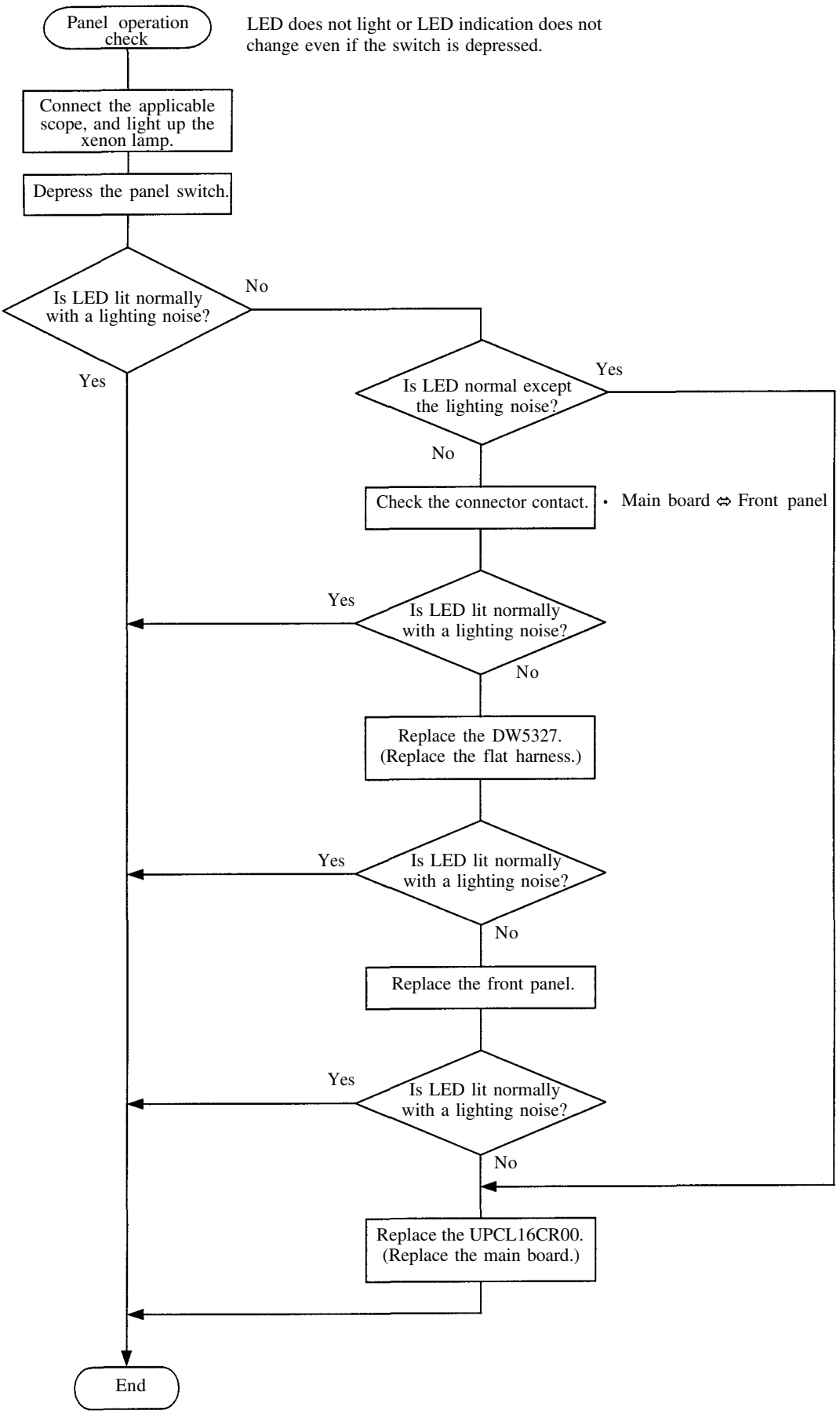

Manual brightness adjustment check
The visual field is dark or too bright.
Set the auto/manual brightness selector to "Manual".
Is the diaphragm controlled with the brightness adjustment switch?
No
Yes
Is the scope correctly connected?
Yes
Is the diaphragm controlled with the brightness adjustment switch?
No
Check the harness connection.
Check the diaphragm mechanism.
• UPCL16CR00 ⇔ UPNS6OU
• Diaphragm blade is deformed or caught.
Yes
Is the diaphragm controlled with the brightness adjustment switch?
No
Replace the UPCN50U. (Replace the scope detection board.)
Yes
Is the diaphragm controlled with the brightness adjustment switch?
No
Replace the UPCL16CR00. (Replace the main board.)
Yes
Is the diaphragm controlled with the brightness adjustment switch?
No
Replace the UPNS6OU. (Replace the diaphragm unit.)
End

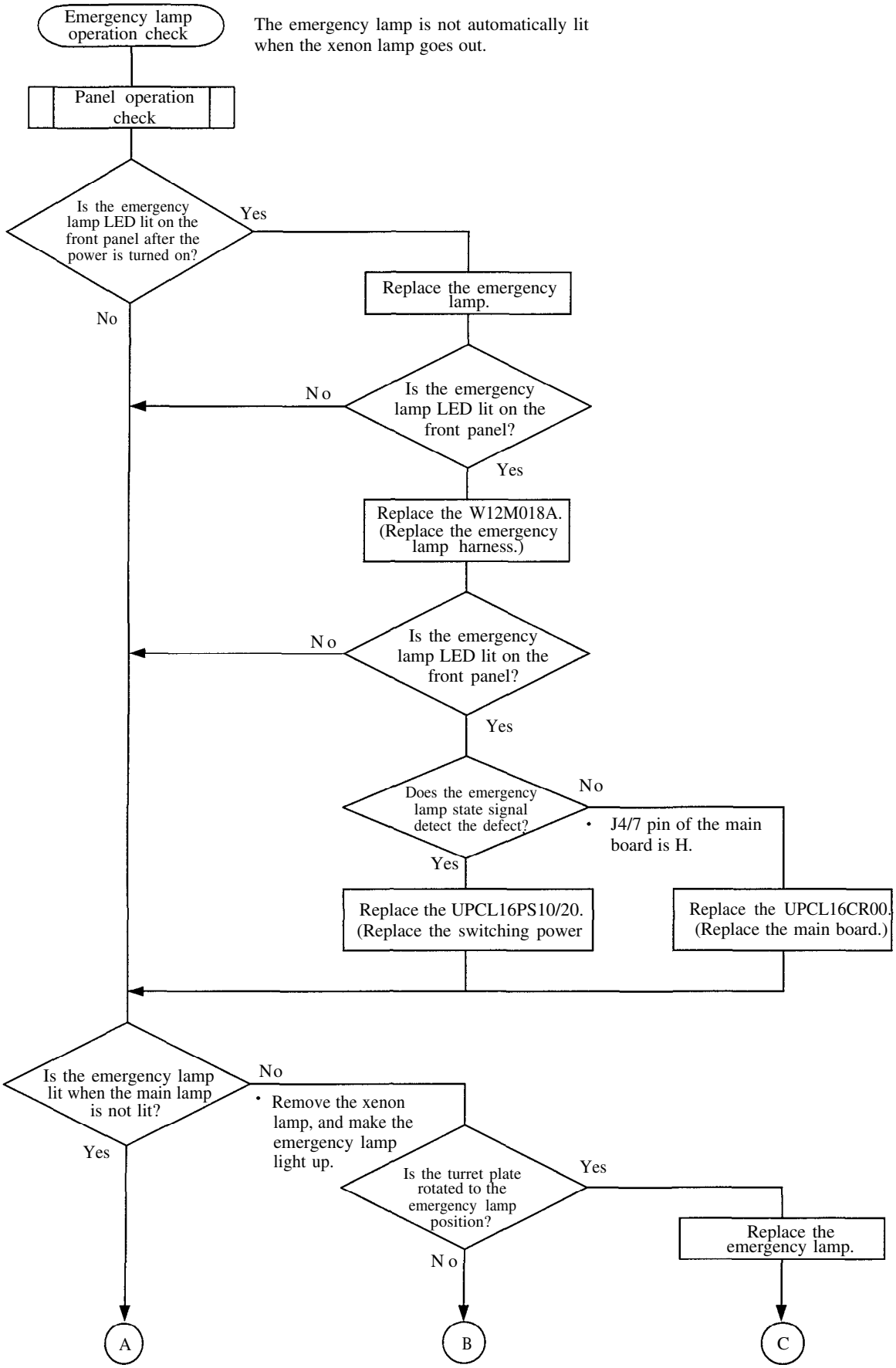

Automatic brightness adjustment check 1 (Automatic brightness adjustment with the scope pin)
The visual field is dark or too bright.
Manual brightness adjustment check
Connect to the system allowing automatic brightness adjustment.
• Connect the CV and scope.
Does the automatic brightness adjustment work correctly?
No
Yes
Is INDEX appropriate? (Usually, "0" is standard.)
Yes
Does the automatic brightness adjustment work correctly?
No
Check the harness connection.
• UPCL16CR00 ⇔ UPNS6OU
Yes
Does the automatic brightness adjustment work correctly?
No
Connect the automatic light control cable (MH-966) to the connector on the rear panel.
Does the automatic brightness adjustment work correctly?
No
Yes
Replace the S socket 1U. (Replace the scope socket unit.)
Replace the UPCL16CR00. (Replace the main board.)
Yes
Does the automatic brightness adjustment work correctly?
No
Check the connected CV or scope.
End

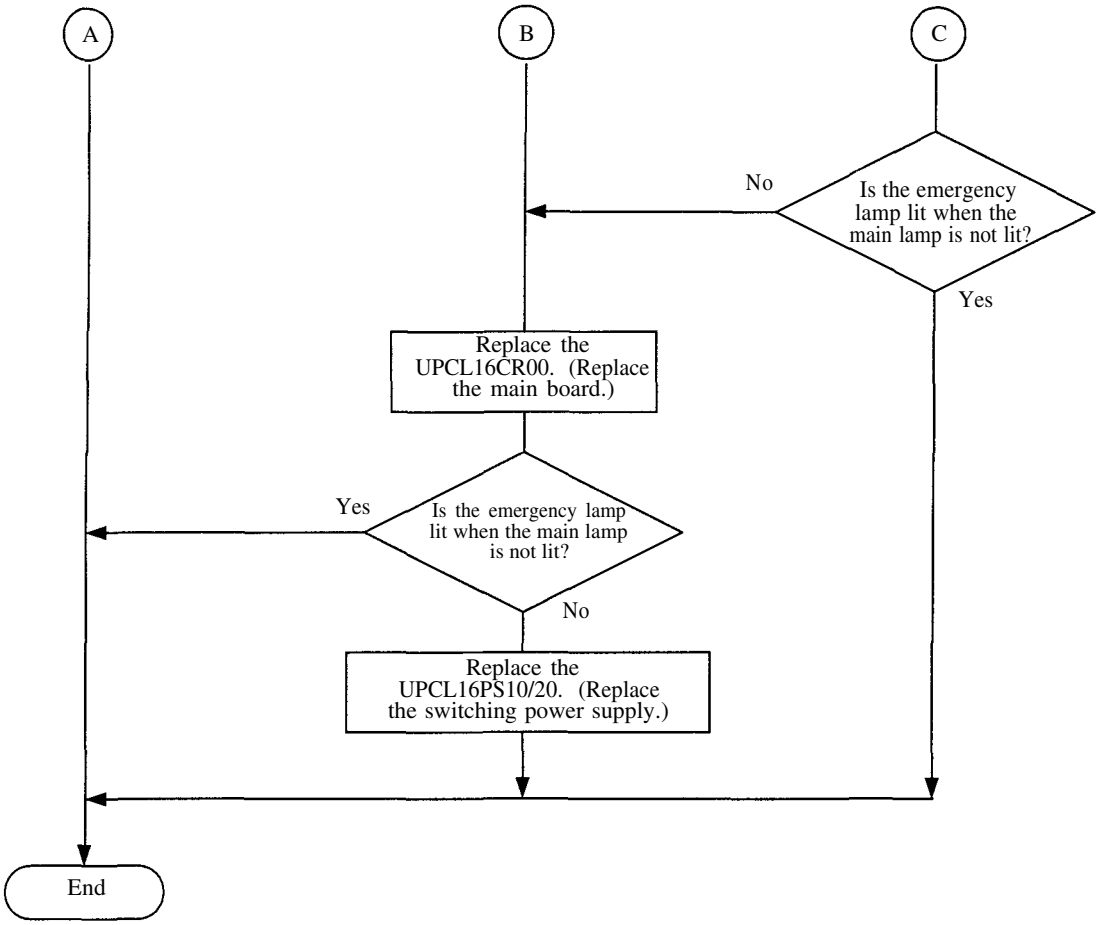

Automatic brightness adjustment check 2 (Automatic brightness adjustment with the rear cable)
The visual field is dark or too bright.
Manual brightness adjustment check
Connect to the system allowing automatic brightness adjustment.
• Connect the CV and CLV-160 via the light control cable.
Does the automatic brightness adjustment work correctly?
No
Yes
Is INDEX optimum? (Usually, "0" is standard.)
Yes
Does the automatic brightness adjustment work correctly?
No
Check the connection of the light control cable (MH-966).
• Mal-connection
• Contact failure
Yes
Does the automatic brightness adjustment work correctly?
No
Remove the connected light control cable (MH-966).
Does the automatic brightness adjustment work correctly?
No
Yes
Replace the light control cable (MH-966).
Yes
Does the automatic brightness adjustment work correctly?
No
Check the harness in the light source.
• Broken wire or mal-connection.
A
B
C

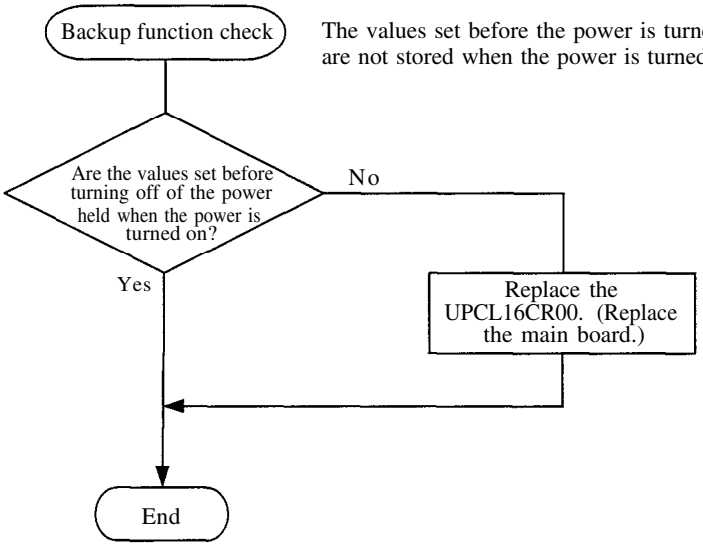

A
B
C
Yes
Does the automatic brightness adjustment work correctly?
No
Replace the UPCL16CR00. (Replace the main board.)
Yes
Does the automatic brightness adjustment work correctly?
No
Check the connected CV or scope.
End

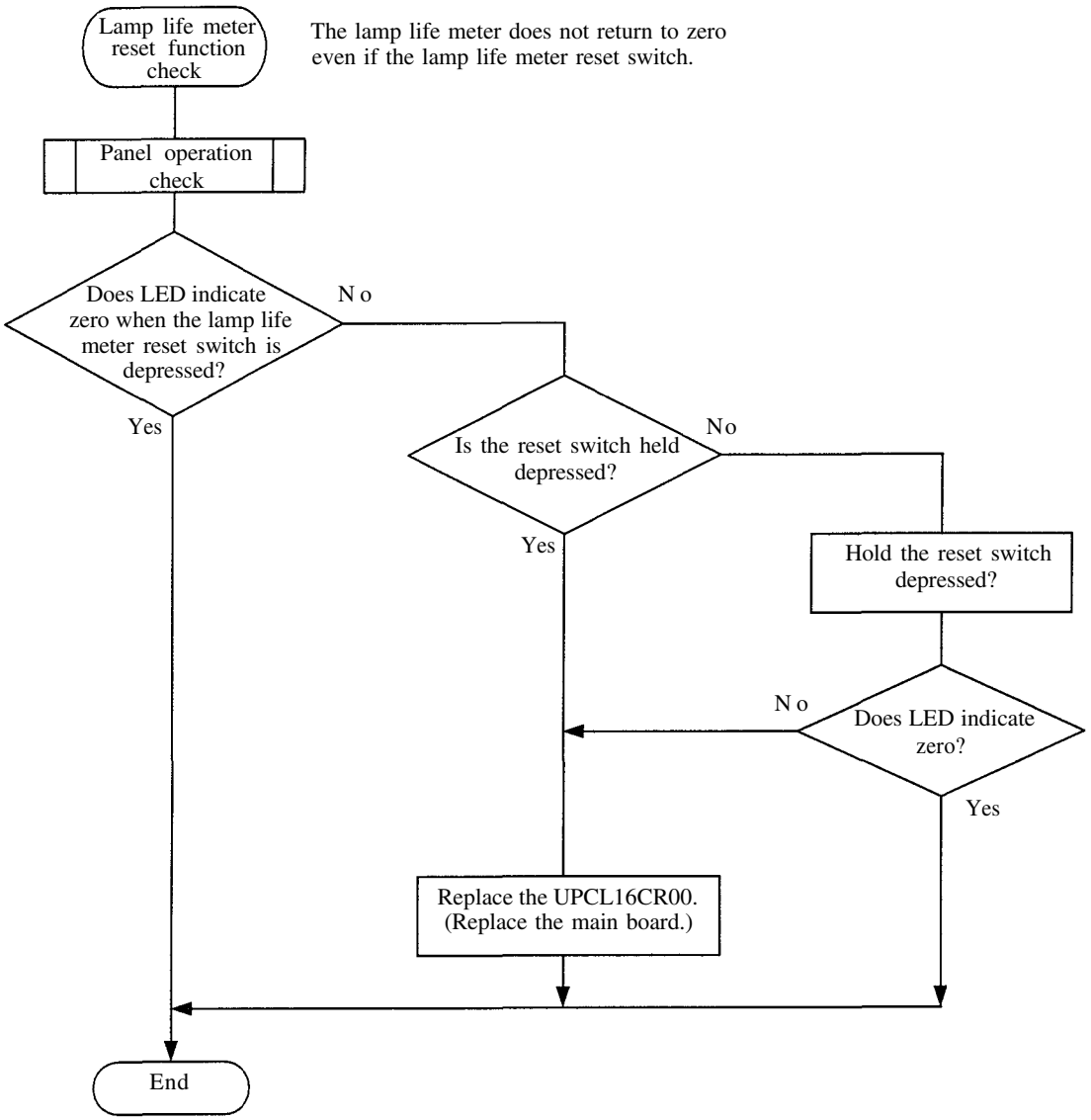

Lamp brightness check
The visual field is dark or too bright.
Set the light source to the maximum brightness in manual mode.
Set the standard filter.
Is the lamp brightness optimum?
No
Yes
Check the scope connection.
Yes
Is the lamp brightness optimum?
No
Check INDEX.
• Set to MAX.
Does the diaphragm work normally?
No
Yes
Manual brightness adjustment check
Yes
Is the lamp brightness optimum?
No
Check that the standard filter (supplied with the main unit) is set in the standard filter frame of the turret plate.
Yes
Is the lamp brightness optimum?
No
Replace the xenon lamp (Y1064S).
Yes
Is the lamp brightness optimum?
No
Replace the UPCL16PS10/20. (Replace the switching power supply.)
End

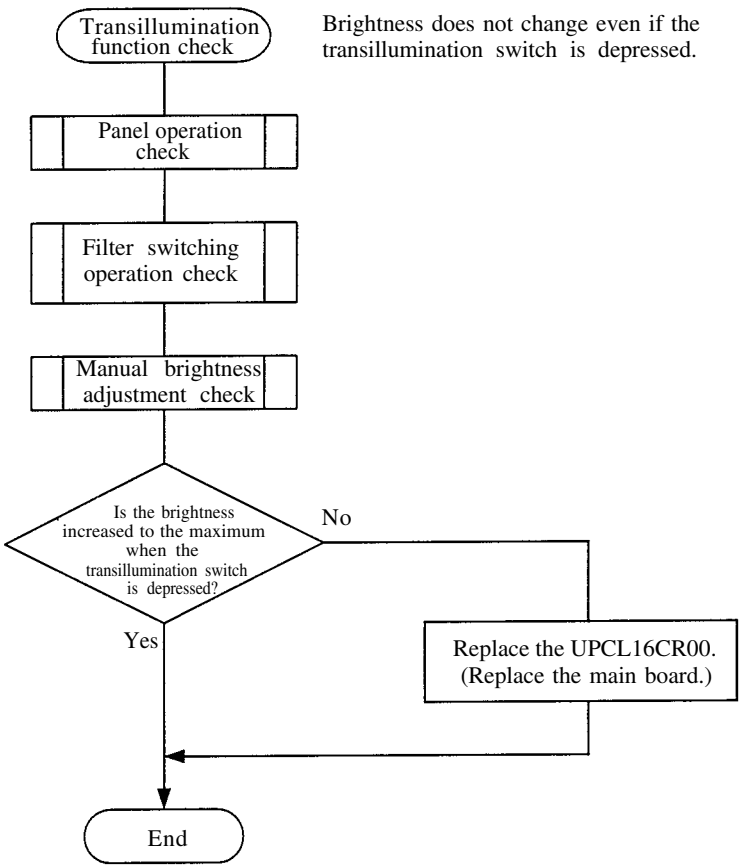

Panel operation check
LED does not light or LED indication does not change even if the switch is depressed.
Connect the applicable scope, and light up the xenon lamp.
Depress the panel switch.
Is LED lit normally with a lighting noise?
No
Yes
Is LED normal except the lighting noise?
Yes
No
Check the connector contact.
• Main board ⇔ Front panel
Is LED lit normally with a lighting noise?
Yes
No
Replace the DW5327. (Replace the flat harness.)
Is LED lit normally with a lighting noise?
Yes
No
Replace the front panel.
Is LED lit normally with a lighting noise?
Yes
No
Replace the UPCL16CR00. (Replace the main board.)
End


Emergency lamp operation check
The emergency lamp is not automatically lit when the xenon lamp goes out.
Panel operation check
Is the emergency lamp LED lit on the front panel after the power is turned on?
Yes
No
Replace the emergency lamp.
Is the emergency lamp LED lit on the front panel?
No
Yes
Replace the W12M018A. (Replace the emergency lamp harness.)
Is the emergency lamp LED lit on the front panel?
No
Yes
Does the emergency lamp state signal detect the defect?
No
• J4/7 pin of the main board is H.
Yes
Replace the UPCL16PS10/20. (Replace the switching power
Replace the UPCL16CR00. (Replace the main board.)
Is the emergency lamp lit when the main lamp is not lit?
No
• Remove the xenon lamp, and make the emergency lamp light up.
Yes
Is the turret plate rotated to the emergency lamp position?
Yes
Replace the emergency lamp.
No
A
B
C


A
B
C
No
Is the emergency lamp lit when the main lamp is not lit?
Yes
Replace the UPCL16CR00. (Replace the main board.)
Yes
Is the emergency lamp lit when the main lamp is not lit?
No
Replace the UPCL16PS10/20. (Replace the switching power supply.)
End


Backup function check
The values set before the power is turned off are not stored when the power is turned off.
Are the values set before turning off of the power held when the power is turned on?
No
Yes
Replace the UPCL16CR00. (Replace the main board.)
End


Lamp life meter reset function check
The lamp life meter does not return to zero even if the lamp life meter reset switch.
Panel operation check
Does LED indicate zero when the lamp life meter reset switch is depressed?
No
Yes
Is the reset switch held depressed?
No
Yes
Hold the reset switch depressed?
No
Does LED indicate zero?
Yes
Replace the UPCL16CR00. (Replace the main board.)
End


Transillumination function check
Brightness does not change even if the transillumination switch is depressed.
Panel operation check
Filter switching operation check
Manual brightness adjustment check
Is the brightness increased to the maximum when the transillumination switch is depressed?
No
Yes
Replace the UPCL16CR00. (Replace the main board.)
End

5. DISASSEMBLING PROCEDURE

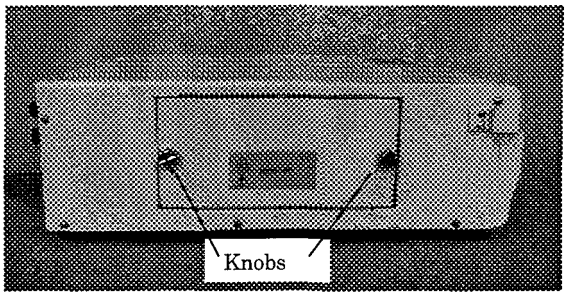
1. General Precautions on Disassembling

- Replace the parts and wires to the original positions.
- For electrical safety and standard, be sure to reassemble the following parts to the original states.
  1. Insulation tube and mylar sheet
  2. Cables clamped and separated from the heating parts or high-voltage parts
  3. Cover screws with a toothed lock washer to suppress a radiation noise
- Use the specified parts.
- The parts used in this unit are designed protective against vibration, heat and high voltage. Be sure to select the parts with the same characteristics from the parts list when replacing the parts.
- Be careful when disconnecting the cable housing.
- Don't pull the cable. Be sure to use the special tool.

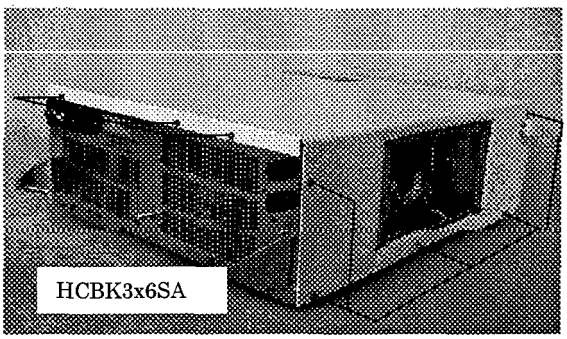
2. Jigs and Tools

No	Name	No.	Specification	Remarks
1	Phillips screwdriver No. 2	OT0287	150mm	
2	Box screwdriver(5.5mm)	OT0078		
3	Nippers	OT0051		

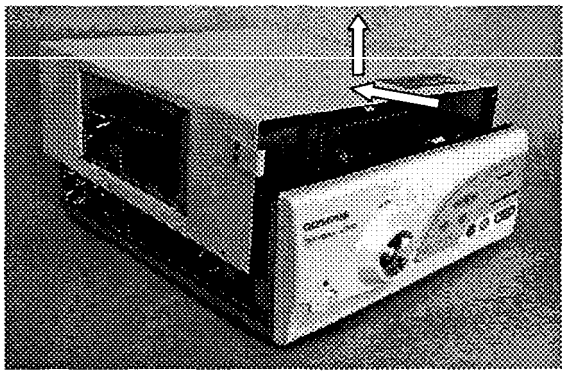
3. Disassembling Procedure



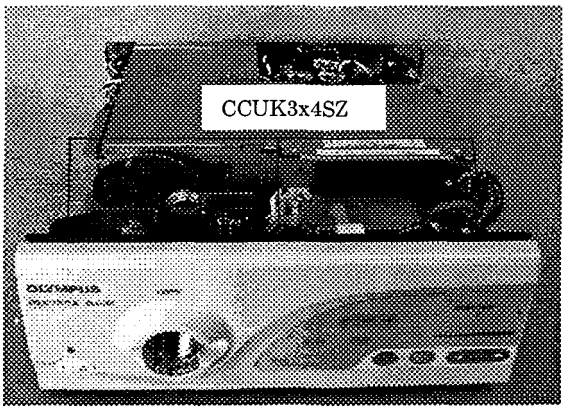
1. Top cover
(1) Turn the knobs, and remove the lamp access cover.



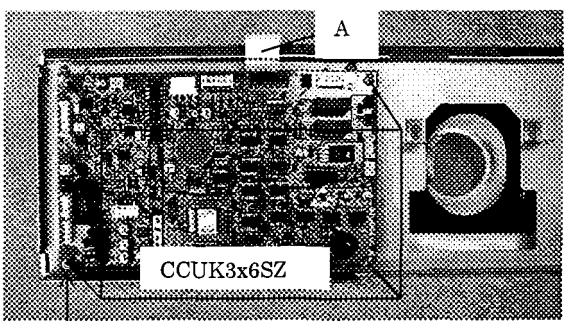
(2) Remove the screws on the rear panel.
Phillips screwdriver No.2 (HCBK3x6SA x 3)
(3) Remove the screws from the side panel.
Phillips screwdriver No.2 (HCBK3x6SA x 10)



(4) Remove the top cover.

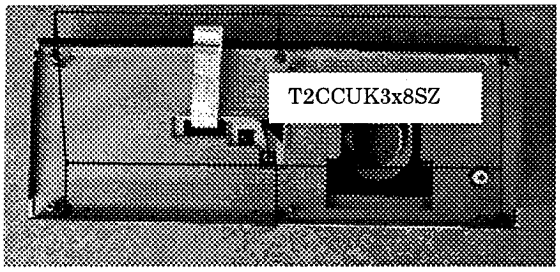


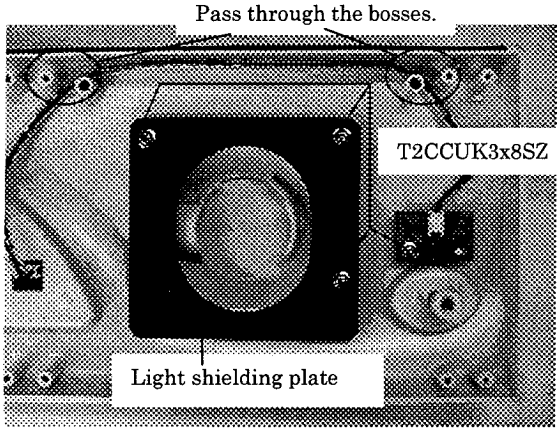
2. Front panel
(1) Remove the screws that secure the front panel to the chassis.
Phillips screwdriver No.2 (CCUK3x4SZ x 3)
(2) Remove the harness from the main board.

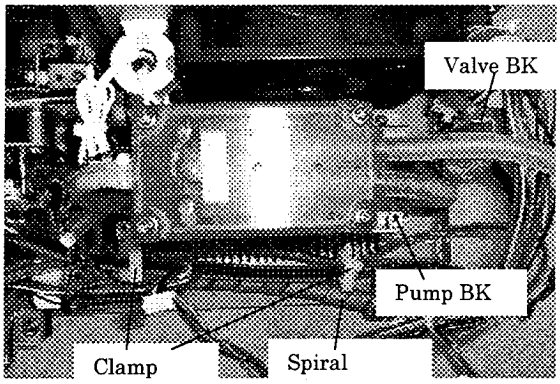


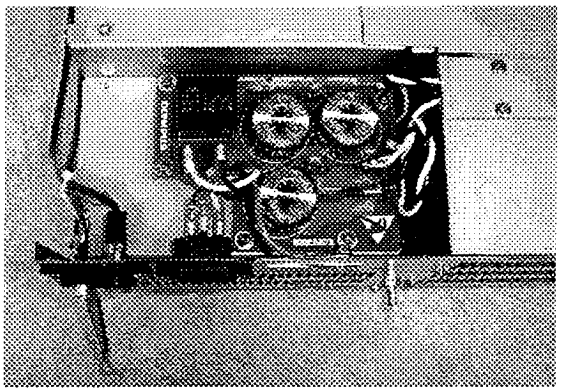
(3) Remove the cable from the sheet switch. (A)
(4) Remove the main board from the FP chassis.
Phillips screwdriver No.2 (CCU3x6SZ x 4)

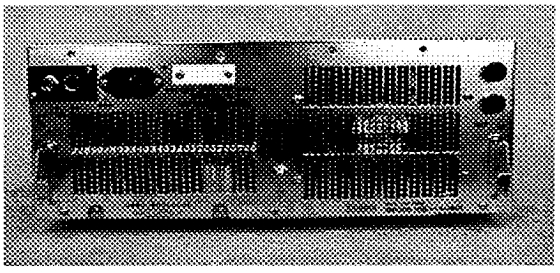
Tightens the capacitor.



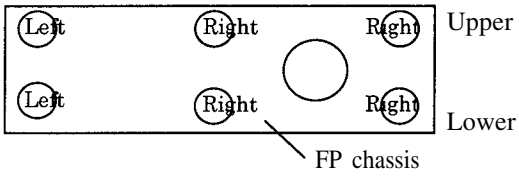






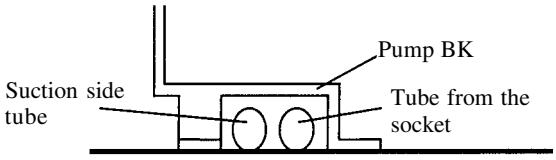


(5) Remove the FP chassis from the panel.
Phillips screwdriver No.2 (T2CCUK3x6SZ x 6)
(When assembling, pay attention to the tightening hole positions. See the drawing below. The idle hole is spare.)



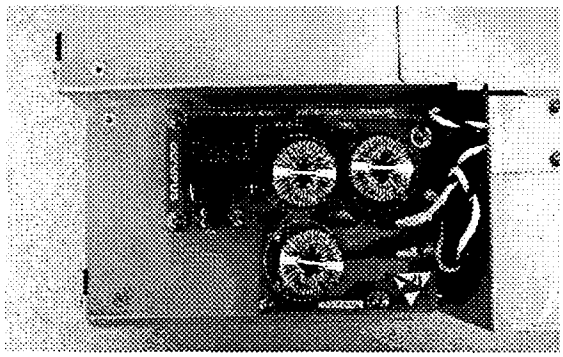
(6) Remove the light shielding plate from the panel.
Phillips screwdriver No.2 (T2CCUK3x8SZ x 3)
(7) Remove the harness from the sheet switch and LED board.
Phillips screwdriver No.2 (T2CCUK3xWZ)

3. Pump
(1) Remove the scope detection harness and the diaphragm harness from the clamp.
(2) Remove the harness wound around the spiral from the pump BK.
Phillips screwdriver No.2 (CCUK3x6SZ x 2)
(3) Remove the spiral from the harness (except the scope detection harness) from the socket.
(4) Cut the two binders, and remove the valve U from the valve BK. Nippers
(5) Cut the binder, and remove the S-tube from the valve U. Nippers
(6) Remove the pump from the chassis.
Box screwdriver(5.5mm)(C6N3SZ x 4)



4. Rear panel
(1) Remove the NF board side of the cable of the inlet-NF board.
(2) Remove the fuse side of the cable of the fuse-NF board.

(3) Remove the screws, and remove the rear panel from the chassis.
Phillips screwdriver No.2 (HCBK3x6SA x 7)

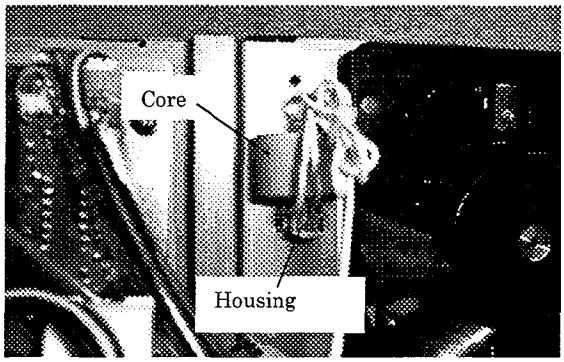


5. NF board

(1) Remove the cable from the NF board.

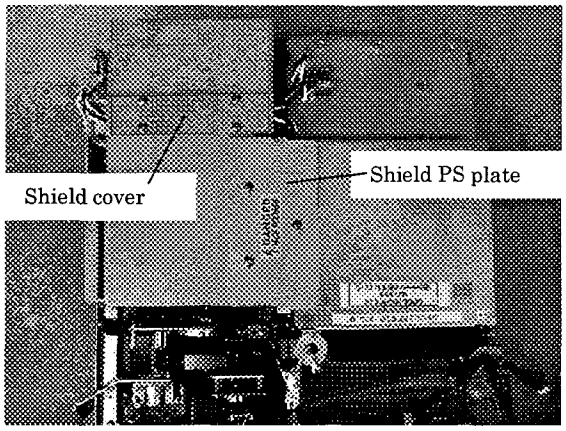
(2) Remove the NF board from the power supply unit.

Phillips screwdriver No.2 (CCUK3x6SZ x 5)



6. Power supply unit

(1) Remove the core, and remove the emergency lamp housing from the power supply unit.

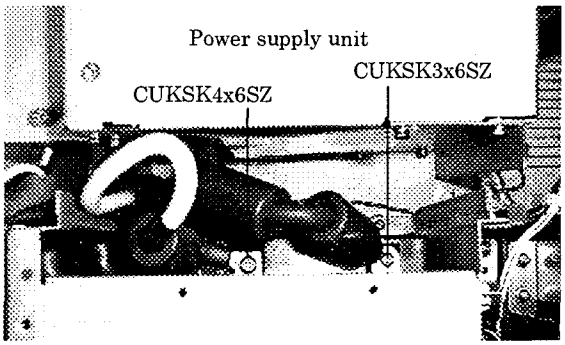


(2) Remove the shield cover.

Phillips screwdriver No.2 (CCUK3x4SZ x 4)

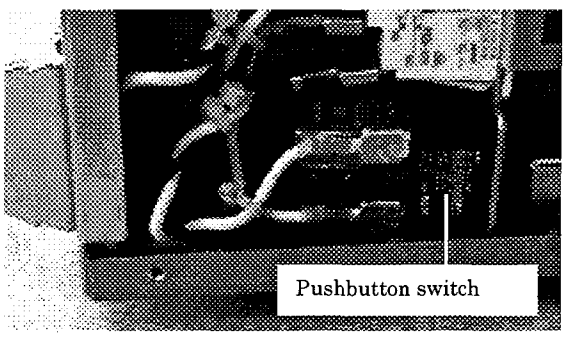
(3) Remove the shield PS plate.

Phillips screwdriver No.2 (CCUK3x6SZ x 3)

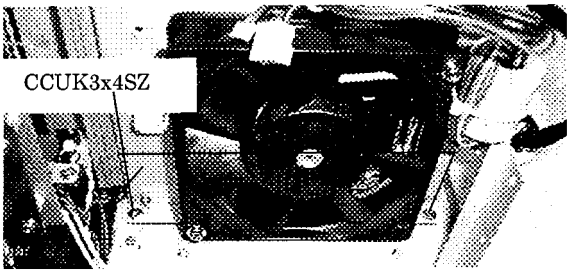


(4) Remove the igniter harness from the electrode.

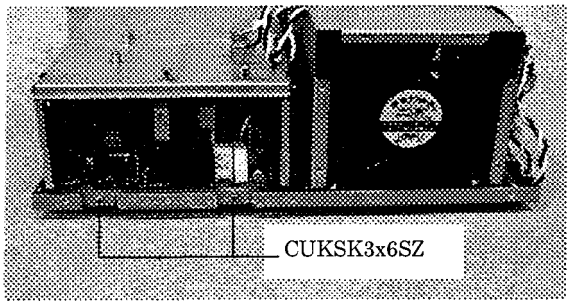
Phillips screwdriver No.2 (CUKSK4x6SZ, CUKSK3x6SZ)



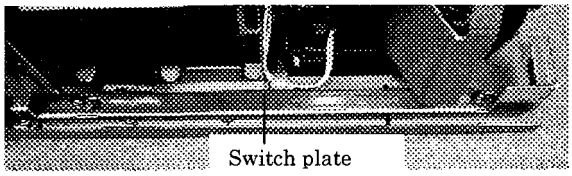
(5) Remove the cable from the power supply unit from the pushbutton switch.



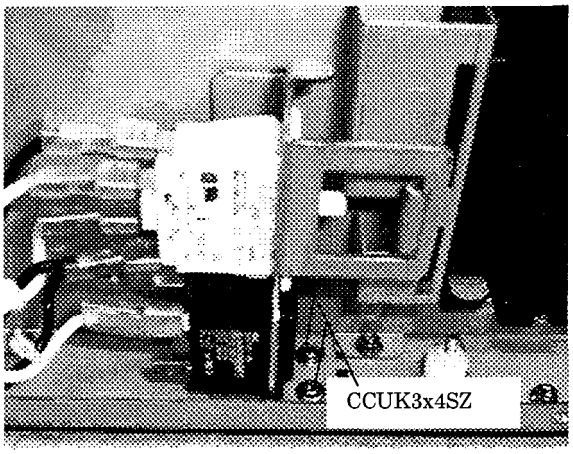
(6) Remove the screw. (Front side)
Phillips screwdriver No.2 (CCUK3x4SZ x 2)



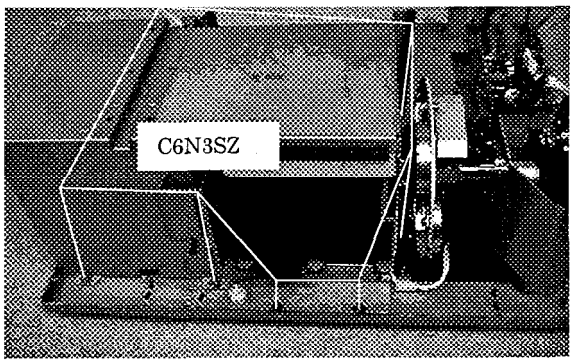
(7) Remove the screws, and remove the power supply unit from the chassis.
Phillips screwdriver No.2 (CUKSK3x6SZ x 2)



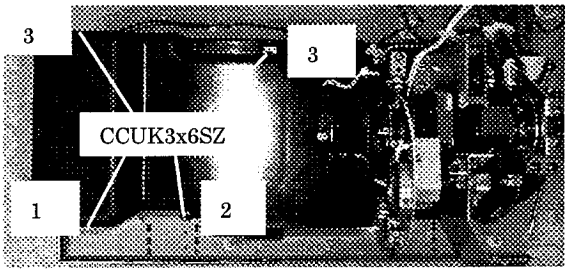
7. Switch collar and pushbutton switch
(1) Remove the switch washer, switch plate and switch plate collar from the chassis.



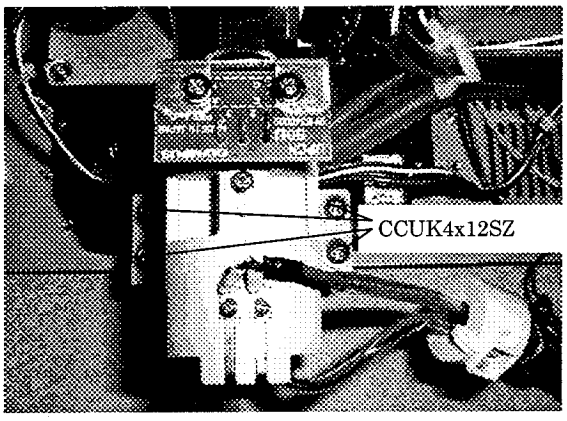
(2) Remove the screws, and remove the switch unit from the chassis.
Phillips screwdriver No.2 (CCUK3x4SZ x 2)



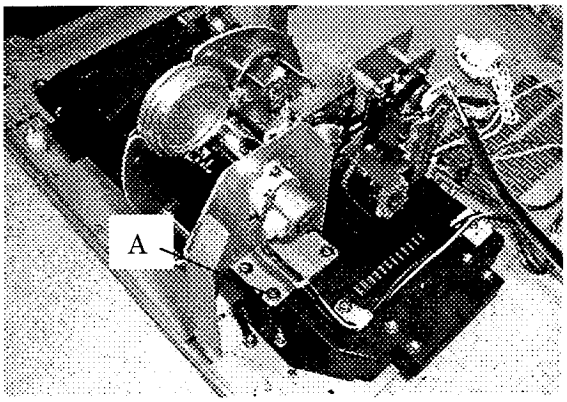
8. Optical unit
(1) Remove the shield case.
Box screwdriver(5.5mm)(C6N3SZ x 7)



(2) Remove the lamp housing.
Phillips screwdriver No.2 (CCUK3x6SZ x 4)
(When assembling, tighten the screws as specified on the left.)

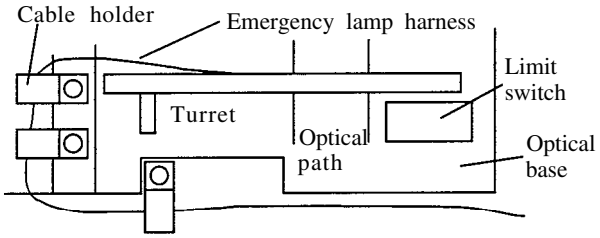


(3) Remove the screws, and remove the S-socket from the optical base.
Phillips screwdriver No.2(CCUK4x12SZ x 4)

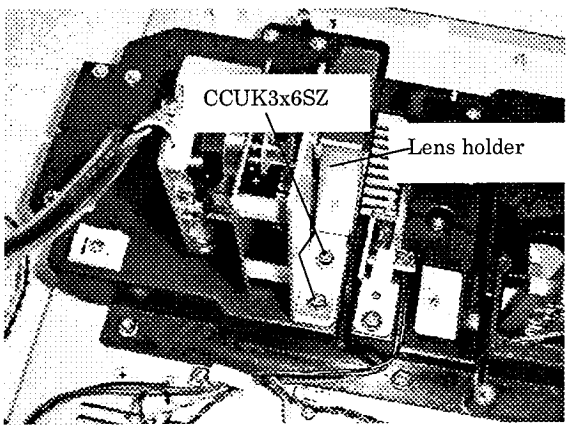


(4) Remove the cable holder from the optical base.
Box screwdriver(5.5mm)(C6N3SZ x 3)

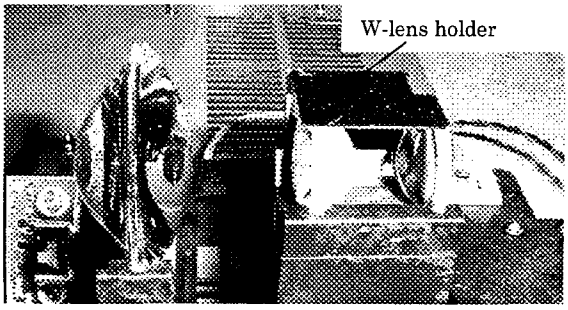
(5) Remove the turret unit from the optical base.
Phillips screwdriver No.2 (CCUK3x6SZ x 3)
(When assembling, tighten the screw A together with the earth strap as shown on the left. For forming of the emergency lamp harness, see the drawing below.)



View from the top

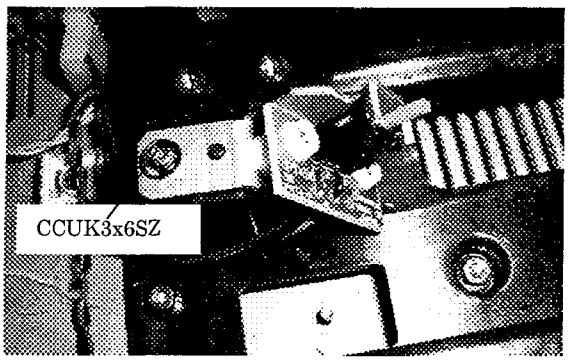


(6) Remove the lens holder and the diaphragm unit from the optical base. (The diaphragm unit is located underside.)
Phillips screwdriver No.2 (CCUK3x6SZ x 2)

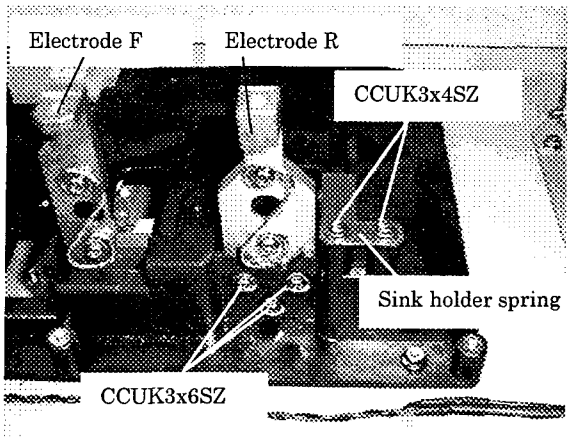


(7) Remove the W-lens holder from the optical base.
Phillips screwdriver No.2(CCUK3x6SZ)

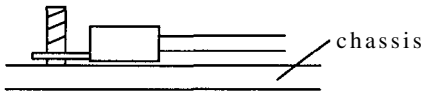
(8) Remove the lens.
(When assembling, pay attention to the lens direction. See the drawing on the left. The lens shall have no dust and stain.)



(9) Remove the limit switch from the optical base.
Phillips screwdriver No.2 (CCUK3x6SZ)



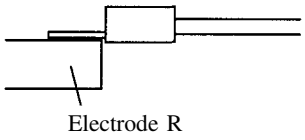
(10) Remove the terminal from the chassis. (CCUK3x4SZ)
(When assembling, pay attention to the terminal direction. See the drawing below.)

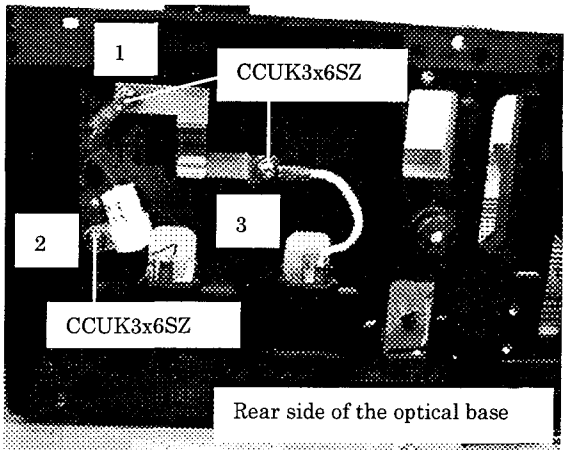


(11) Remove the electrode F from the optical base.

(12) Remove the sink holder spring from the optical base.
Phillips screwdriver No.2 (CCUK3x4SZ x 2)

(13) Remove the cable from the electrode R.
Phillips screwdriver No.2 (CCUK3x4SZ)
(When assembling, pay attention to the terminal direction. See the drawing below.)





(14) Remove the electrode R from the optical base.
Phillips screwdriver No.2 (CCUK3x6SZ x 3)

(15) Remove the screws in the order specified on the left, and remove the discharge spring, the cord stopper, the discharge plate and the cable.
(The discharge spring and the discharge plate shall have no dust and stain.)

6. ASSEMBLING PROCEDURE

1. General Precautions on Assembling

- Replace the parts and wires to the original positions.
- For electrical safety and standard, be sure to reassemble the following parts to the original states.
  1. Insulation tube and mylar sheet
  2. Cables clamped and separated from the heating parts or high-voltage parts
  3. Cover screws with a toothed lock washer to suppress a radiation noise
- Use the specified parts.
- The parts used in this unit are designed protective against vibration, heat and high voltage. Be sure to select the parts with the same characteristics from the parts list when replacing the parts.
- Be careful when disconnecting the cable housing.
- Don't pull the cable. Be sure to use the special tool.
- Be careful not to be injured.
  Some metallic parts have sharp corner or edge. Be careful when handling such parts.
- Be sure to observe the specified torque and dimensions.
  Observe the torque and dimensions when they are specified.
  As for the H-band which secures each tube, first tighten it by the specified torque and then pull the tube to check whether the tube becomes loose or it comes off.
- Clean the parts to be used.
  When re-using the same parts, eliminate the sealing material and tape and clean. For the O-ring and packing, clean the surface of the parts on which the O-ring or packing is mounted.
  Otherwise, it may cause water leakage.
- Don't forget to tighten the screws and nuts.
  Failure in tightening the screws and nuts may cause water leakage.

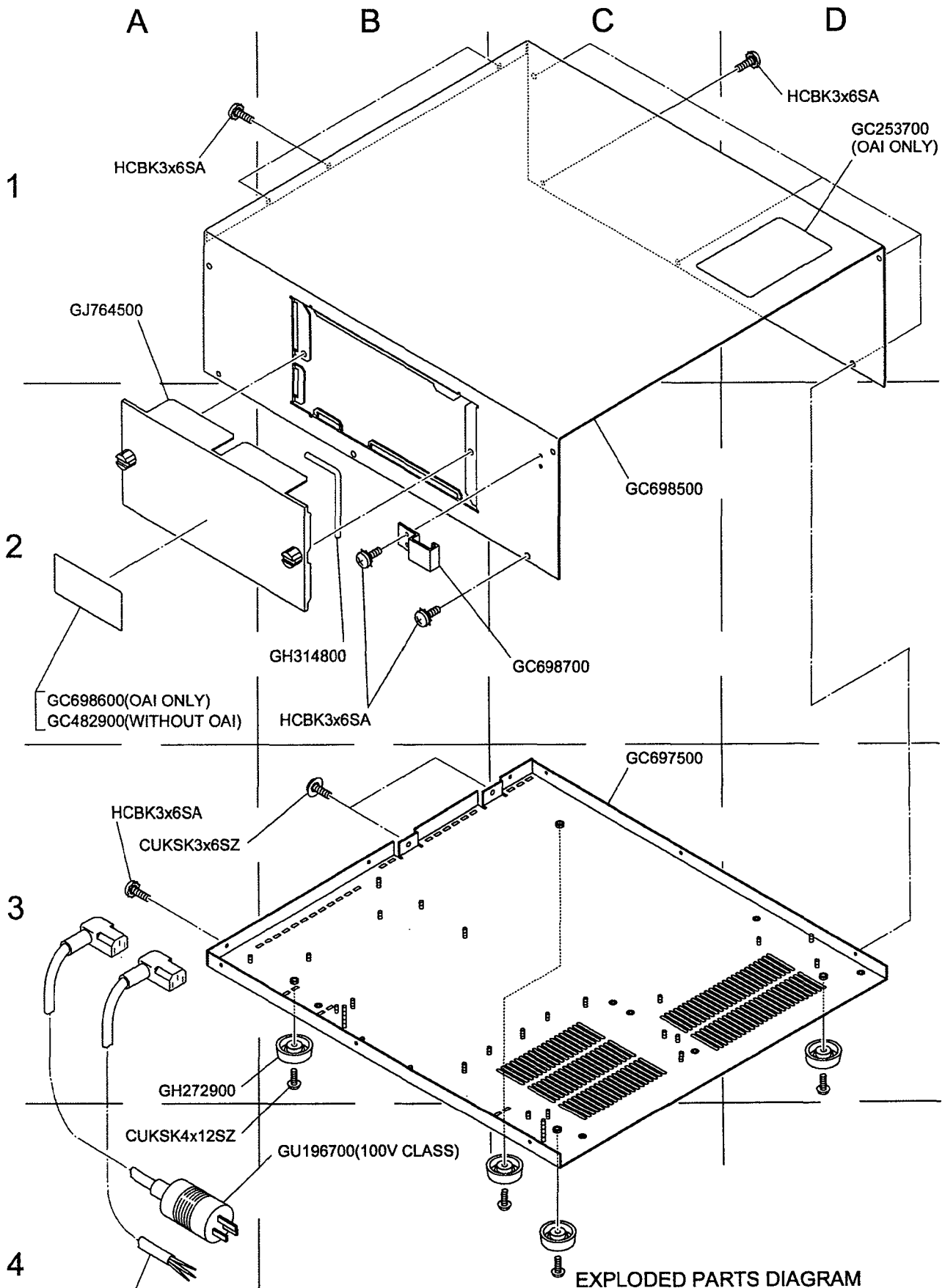
2. Jigs and Tools

No	Name	No.	Specification	Remarks
1	Phillips screwdriver No. 2	OT0287	150 mm	

3. Assembling Procedure

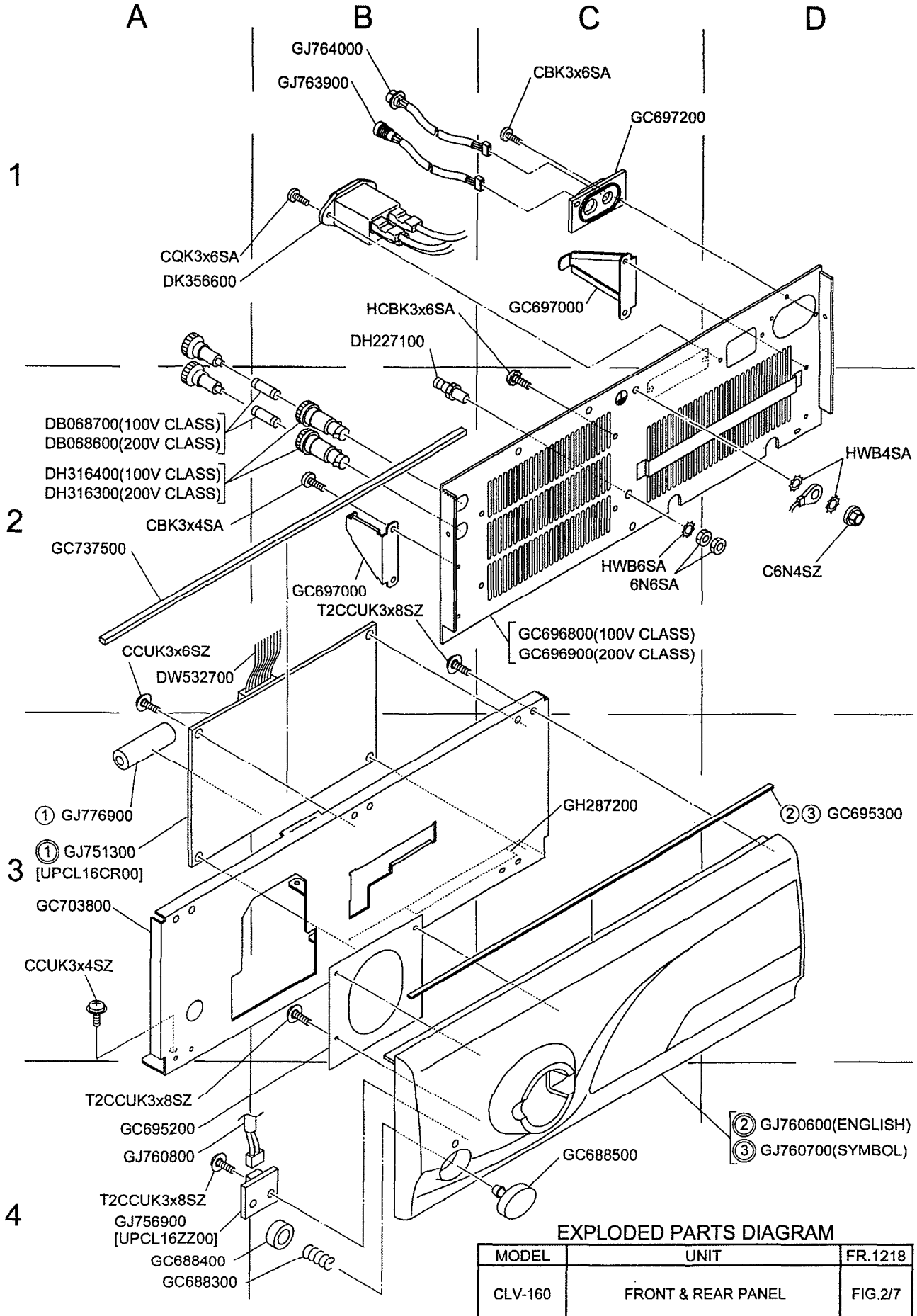
- Reverse the disassembling procedure.

7. EXPLODED PARTS DIAGRAM



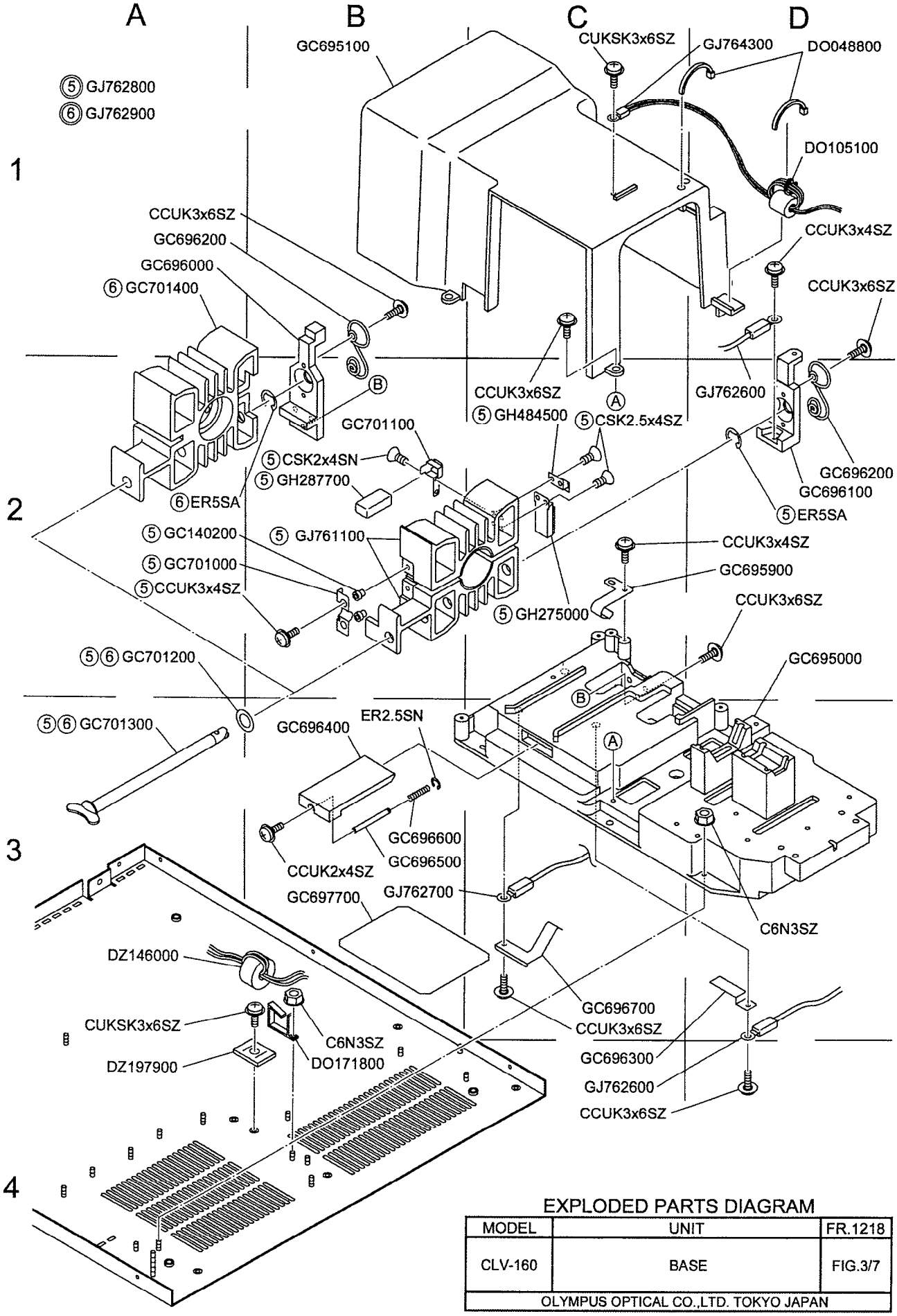
EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1218
CLV-160	TOP COVER	FIG.1/7
OLYMPUS OPTICAL CO.,LTD. TOKYO JAPAN		



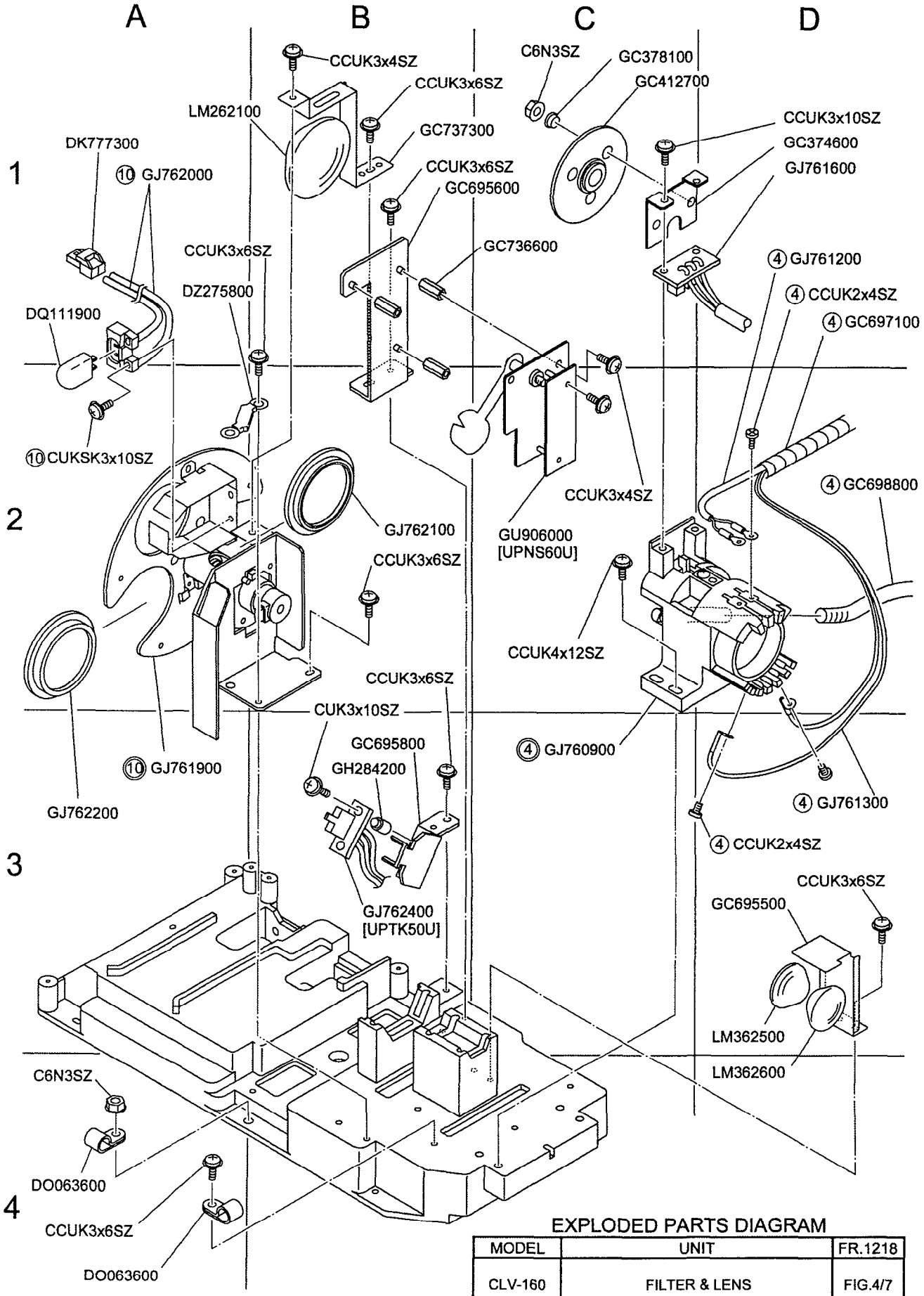
EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1218
CLV-160	FRONT & REAR PANEL	FIG.2/7
OLYMPUS OPTICAL CO.,LTD. TOKYO JAPAN		



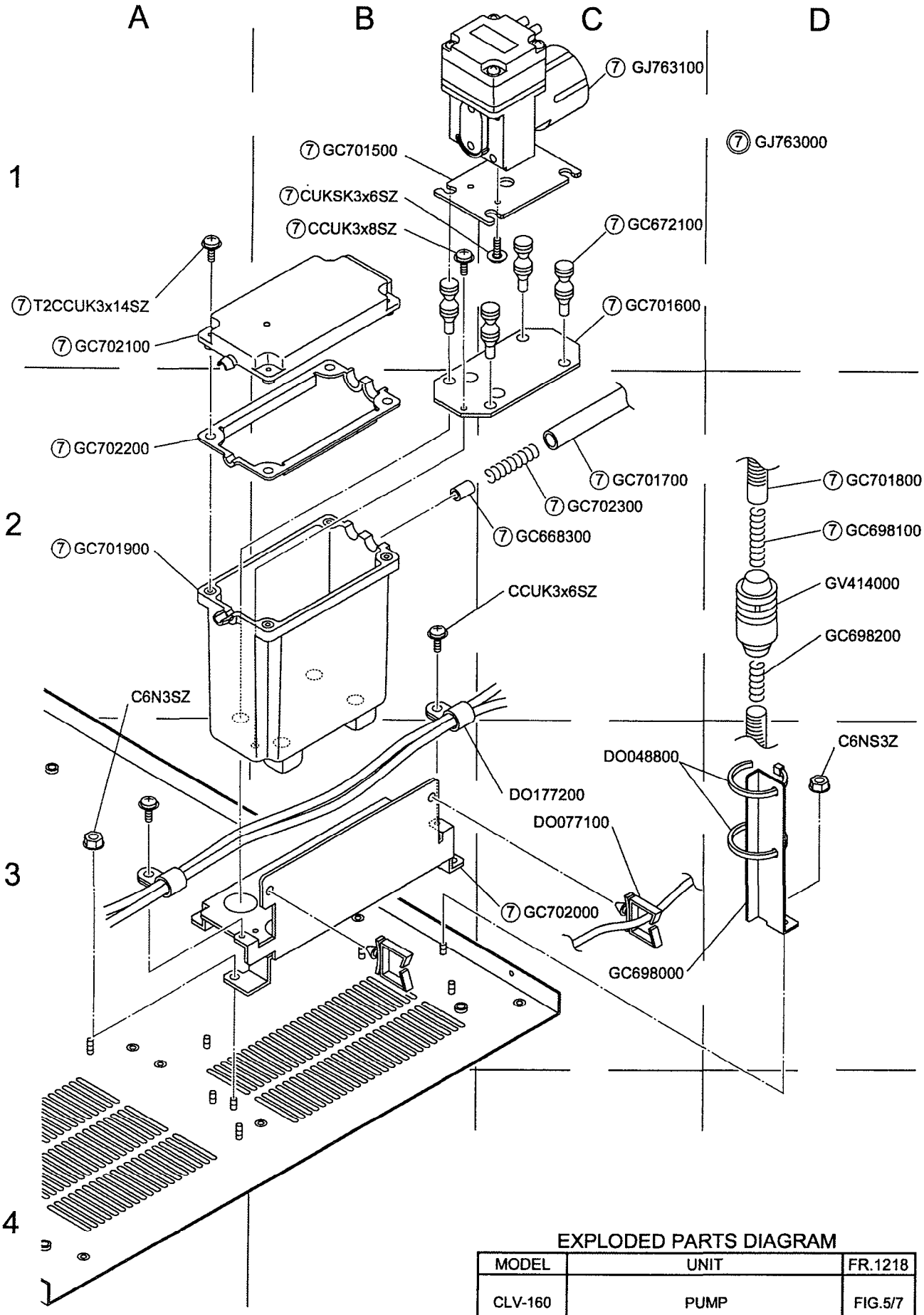
EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1218
CLV-160	BASE	FIG.3/7
OLYMPUS OPTICAL CO.,LTD. TOKYO JAPAN		



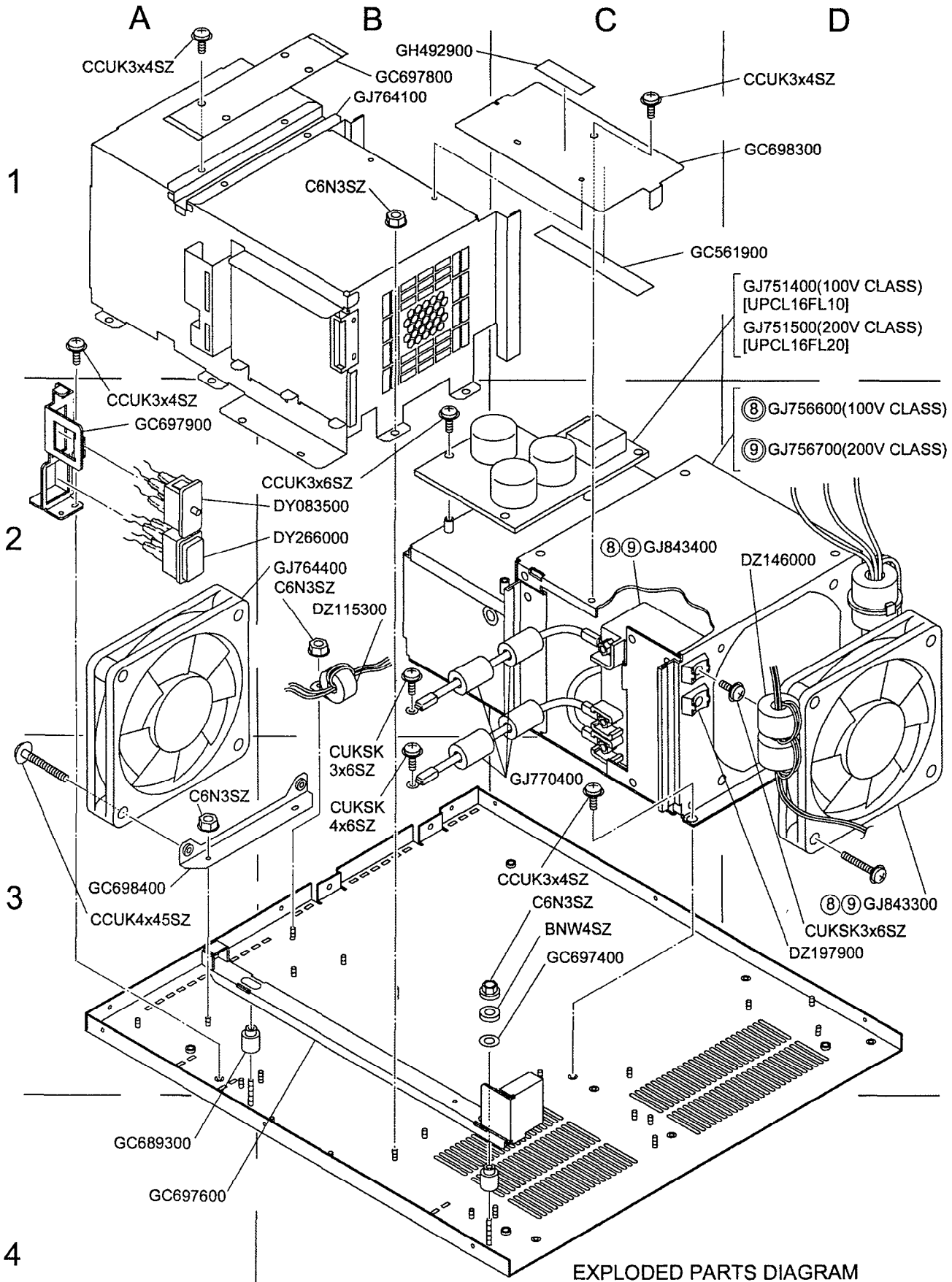
EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1218
CLV-160	FILTER & LENS	FIG.4/7
OLYMPUS OPTICAL CO.,LTD. TOKYO JAPAN		



EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1218
CLV-160	PUMP	FIG.5/7
OLYMPUS OPTICAL CO.,LTD. TOKYO JAPAN		

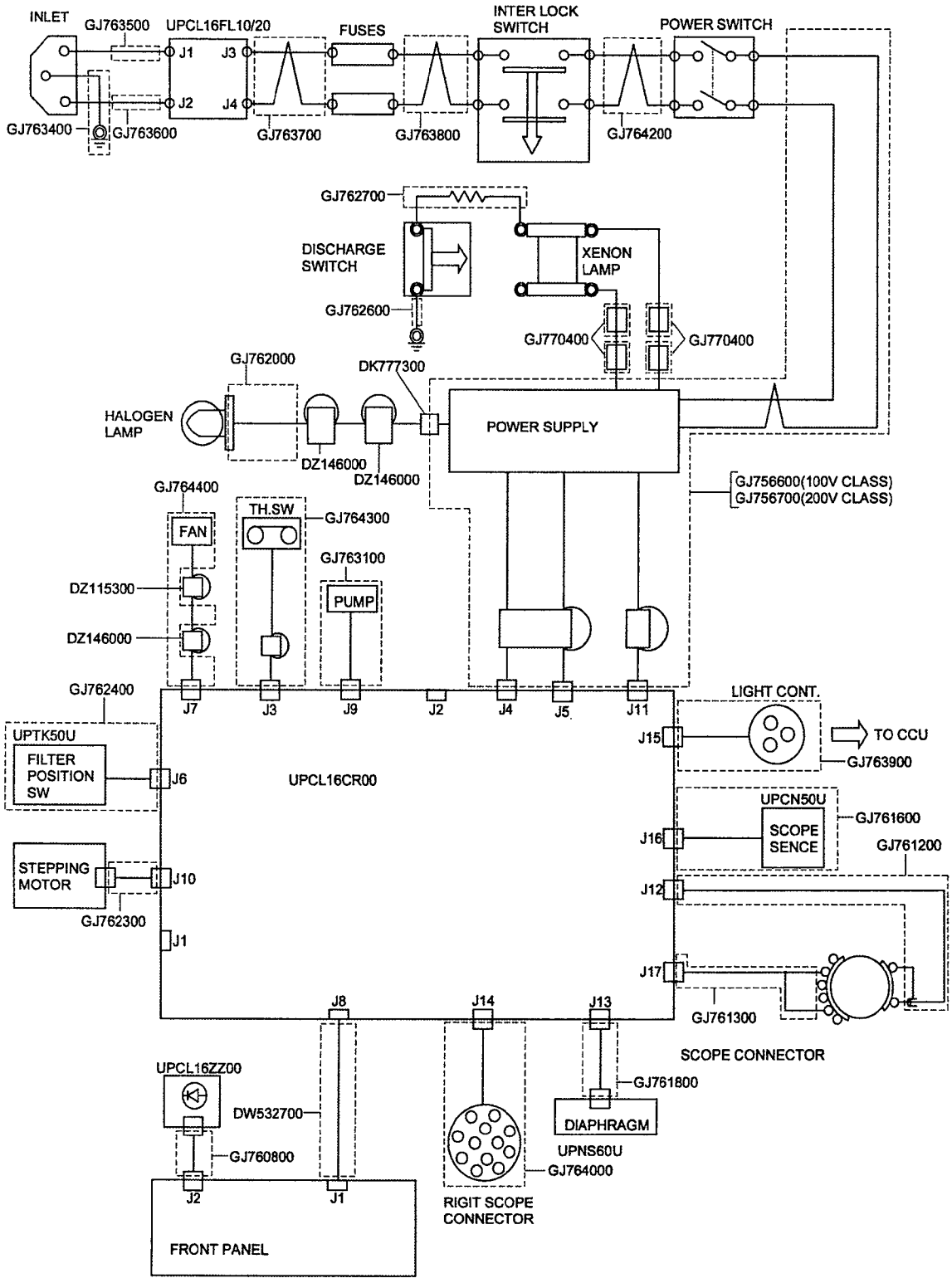


EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1218
CLV-160	MAIN UNIT	FIG.6/7
OLYMPUS OPTICAL CO.,LTD. TOKYO JAPAN		

A B C D

1 2 3 4



MODEL	UNIT	FR.1218
CLV-160	CABLE	FIG.7/7
OLYMPUS OPTICAL CO.,LTD. TOKYO JAPAN		

8. PARTS LIST

PARTS No.	INDEX	PARTS NAME E.	SPECIFICATION	REMARK	CHECK
DB068600	2-A2	FUSE	200V CLASS		
DB068700	2-A2	FUSE	100V CLASS		
DH227100	2-B1	TERMINAL			
DH316300	2-A2	HOLDER	200V CLASS		
DH316400	2-A2	HOLDER	100V CLASS		
DK356600	2-A1	INLET			
DK777300	4-A1	HOUSING			
DO048800	3-D1	BINDER			
DO063600	4-A4	CABLE HOLDER			
DO077100	5-C3	CABLE HOLDER			
DO105100	3-D1	BINDER			
DO171800	3-B4	CLAMPER			
DO177200	5-C3	CABLE HOLDER			
DQ111900	4-A1	HALOGEN			
DW532700	2-A2	CABLE			
DY083500	6-B2	INNTER LOCK SW			
DY266000	6-B2	PUSH BUTTON SW			
DZ115300	6-B2	CORE			
DZ146000	3-A3	CORE			
DZ197900	3-A4	CORE STAND			
DZ275800	4-A1	STRAP			
GC140200	3-A2	SPACER			
GC253700	1-D1	DC PLATE	OAI ONLY		
GC374600	4-D1	LG PLATE			
GC378100	4-C1	SPACER			
GC412700	4-C1	LG FIN			
GC482900	1-A2	PLATE MD631	WITHOUT OAI		
GC668300	5-C2	TUBE SSS			
GC672100	5-C1	RUBBER FOOT			
GC688300	2-A4	SPRING S			
GC688400	2-A4	SPACER			
GC688500	2-C4	MAIN SW			
GC689300	6-A4	SPACER			
GC695000	3-D2	OPTICAL BASE			
GC695100	3-B1	LAMP HOUSE			
GC695200	2-A4	SHADE PLATE			
GC695300	2-D3	WATERPROOF SHEET			
GC695500	4-D3	W LENS HOLDER			
GC695600	4-B1	BRACKET			
GC695800	4-B3	BRACKET			
GC695900	3-D2	SUPPORT SPRING			
GC696000	3-A1	POLE R			
GC696100	3-D2	POLE F			
GC696200	3-A1	SINK SPRING			
GC696300	3-C4	DISCHAGE PLATE			
GC696400	3-B3	DISCHAGE BASE			
GC696500	3-B3	DISCHAGE SPINDLE			
GC696600	3-B3	DISCHARGE COIL			
GC696700	3-C3	DISCHARGE SPRING			
GC696800	2-C2	REAR PANEL10	100V CLASS		
GC696900	2-C2	REAR PANEL20	200V CLASS		
GC697000	2-C1	REAR FOOT			
GC697100	4-D1	SPIRAL			

PARTS No.	INDEX	PARTS NAME E.	SPECIFICATION	REMARK	CHECK
GC697200	2-C1	BASE			
GC697400	6-C3	WASHER			
GC697500	1-C3	CHASSIS			
GC697600	6-A4	PLATE			
GC697700	3-B3	INSULATOR			
GC697800	6-B1	COVER			
GC697900	6-A2	BRACKET			
GC698000	5-C3	BRACKET			
GC698100	5-D2	COIL S			
GC698200	5-D2	COIL M			
GC698300	6-D1	SHIELD PLATE			
GC698400	6-A3	BRACKET			
GC698500	1-C2	TOP COVER			
GC698600	1-A2	HOT SEAL	OAI ONLY		
GC698700	1-C2	TANK HOLDER			
GC698800	4-D2	TUBE			
GC701000	3-A2	HINGE			
GC701100	3-B2	HOLDER			
GC701200	3-A2	WASHER			
GC701300	3-A3	SHAFT			
GC701400	3-A1	HEAT SINK			
GC701500	5-B1	PUMP BASE			
GC701600	5-C1	PUMP PLATE			
GC701700	5-C2	TUBE L			
GC701800	5-D2	TUBE S			
GC701900	5-A2	PUMP CASE			
GC702000	5-C3	BRACKET			
GC702100	5-A1	PUMP CASE			
GC702200	5-A2	P PACKING			
GC702300	5-C2	COIL L			
GC703800	2-A3	FP CHASSIS			
GC736600	4-C1	SPACER			
GC737300	4-B1	LENS HOLDER			
GC737500	2-A2	GASKET			
GH272900	1-A3	FOOT			
GH275000	3-C2	MINI CATCH			
GH284200	4-B3	COLLER			
GH287200	2-C3	PLATE			
GH287700	3-B2	MAGNET			
GH314800	1-B2	TOOL			
GH484500	3-C2	LOCK			
GH492900	6-B1	PLATE			
GH561900	6-C1	GASKET			
GJ751300	2-A3	UPCL16CR00			
GJ751400	6-D1	UPCL16FL10	100V CLASS		
GJ751500	6-D1	UPCL16FL20	200V CLASS		
GJ756600	6-D2	UPCL16PS10	400V CLASS		
GJ756700	6-D2	UPCL16PS20	200V CLASS		
GJ756900	2-A4	UPCL16ZZ00			
GJ760600	2-D4	F PANEL EU	ENGLISH		
GJ760700	2-D4	F PANEL SU	SYMBOL		
GJ760800	2-A4	W12M021A			
GJ760900	4-C3	S SOKET U			

PARTS No.	INDEX	PARTS NAME E.	SPECIFICATION	REMARK	CHECK
GJ761100	3-B2	HEAT SINK U			
GJ761200	4-D1	W12M009A			
GJ761300	4-D3	W1PM010A			
GJ761600	4-D1	CN BOARD U			
GJ761800	7-C3	W12M011A			
GJ761900	4-A3	TURRET U			
GJ762000	4-A1	W12M018A			
GJ762100	4-B2	FILTER STU			
GJ762200	4-A3	FILTER OPU			
GJ762300	7-A3	W12M017A			
GJ762400	4-B3	LIMIT SWU			
GJ762600	3-D2	W12M019A			
GJ762700	3-B3	W12M020A			
GJ762800	3-A1	HEAT SINK FU			
GJ762900	3-A1	HEAT SINK RU			
GJ763000	5-D1	PUMP BKU			
GJ763100	5-C1	W12M013A			
GJ763400	7-A1	W12M001A			
GJ763500	7-A1	W12M002A			
GJ763600	7-A1	W12M003A			
GJ763700	7-B1	W12M004A			
GJ763800	7-B1	W12M005A			
GJ763900	2-B1	W12M007A			
GJ764000	2-B1	W12M012A			
GJ764100	6-B1	SHIELD CASE U			
GJ764200	7-C1	W12M006A			
GJ764300	3-D1	W12M014A			
GJ764400	6-B2	W12M015A			
GJ764500	1-A1	LAMP COVER U			
GJ770400	6-C3	CORE U			
GJ776900	2-A3	BATTERY			
GJ843300	6-D3	W12M024A			
GJ843400	6-C2	W12M025A			
GU196700	1-B4	POWER CABLE	100V CLASS		
GU197300	1-A4	POWER CABLE	200V CLASS		
GU906000	4-C2	UPNS60U			
GV414000	5-D2	VALVE U			
LM262100	4-B1	LENS			
LM362500	4-D3	LENS			
LM362600	4-D4	LENS			
6N6SA	2-C2	NUT		WE501033	
BNW4SZ	6-C3	WASHER		WE303014	
C6N3SZ	3-D3	NUT		WE178001	
C6N4SZ	2-D2	NUT		WE178003	
CBK3x4SA	2-A2	SCREW		WE128010	
CBK3x6SA	2-C1	SCREW		WE128012	
CCUK2x4SZ	3-B3	SCREW		WE139047	
CCUK3x10SZ	4-D1	SCREW		WE139030	
CCUK3x4SZ	2-A3	SCREW		WE139018	
CCUK3x6SZ	2-A2	SCREW		WE139002	
CCUK3x8SZ	5-B1	SCREW		WE139006	
CCUK4x12SZ	4-C2	SCREW		WE139057	
CCUK4x45SZ	6-A3	SCREW		WE139010	

PARTS No.	INDEX	PARTS NAME E.	SPECIFICATION	REMARK	CHECK
CQK3x6SA	2-A1	SCREW		WE110039	
CSK2.5x4SZ	3-C2	SCREW		WE106174	
CSK2x4SN	3-B2	SCREW		WE106024	
CUK3x10SZ	4-B2	SCREW		WE114102	
CUKSK3x10SZ	4-A2	SCREW		WE168012	
CUKSK3x6SZ	1-A3	SCREW		WE168011	
CUKSK4x12SZ	1-A4	SCREW		WE168003	
CUKSK4x6SZ	6-B3	SCREW		WE168087	
ER2.5SN	3-B3	E-RING		WE307038	
ER5SA	3-A2	E-RING		WE307017	
HCBK3x6SA	1-A1	SCREW		WE129002	
HWB4SA	2-D2	WASHER		WE306012	
HWB6SA	2-C2	WASHER		WE306016	
T2CCUK3x14SZ	5-A1	SCREW		WE155015	
T2CCUK3x8SZ	2-B2	SCREW		WE155001	

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